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In this issue



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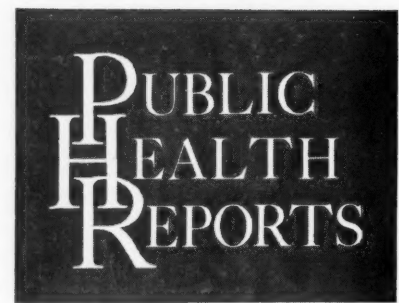
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The small boy with cholera was one of thousands stricken by the disease in Bengal in 1958. (See report on the epidemics of cholera and smallpox in East Pakistan, pp. 26-36.)

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U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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PUBLIC HEALTH SERVICE

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Vol.

Described as a valuable administrative tool, a system of gathering statistics on health services is outlined in relation to health department programs.

Health Service Statistics Record System

DORIS L. DUXBURY

HEALTH departments are constantly coping with the problems of insufficient money and people to carry on their present programs; at the same time, the rapidly growing population is making demands for new and increased health services. Facts concerning past and present services to the current programs are sorely needed as a means of evaluating past services, redesigning current operations, and determining priorities for the future. How can we obtain these facts in a simple manner?

Most public health workers are already overburdened with recordkeeping, and we need to be very cautious about adding to this load. However, many of the present recordkeeping systems are designed to provide specific information regarding a certain program without thought of relating it to other information concerning the same program or to other programs.

The scope of public health services is continually broadening, and more and more disciplines are represented on the staffs of health departments. The result is that no one program is conducted solely by one organizational unit of the department, but rather through the co-

operative effort of many disciplines from several program units. For example, usually the tuberculosis services of a health department include the work of not only the tuberculosis division but also other divisions such as nursing, nutrition, education, social service, and environmental health. This interdependence of disciplines is increasing rather than decreasing, and as it increases so will the need increase for interrelated statistics. To collect service statistics from several units concerning a single program is both a necessity and a problem.

For some time, statisticians of the Michigan Department of Health had been disturbed by the lack of service statistics compiled by program and had recognized a need for a system to provide these data on a departmentwide basis regardless of organizational units. A new system began in the Michigan Department of Health the day the chief of the nutrition section came to the statistical methods section for help with the reporting system for her section. She commented that the daily reports were time consuming to tabulate, and once counted had little meaning for they could not be related to each other and, consequently, were of little value for program planning or evaluation. The nutrition section seemed a logical unit for a pilot study in the use of a new system. There were only five members on the staff, and they

Miss Duxbury is chief of the statistical methods section in the division of disease control, records, and statistics, of the Michigan Department of Health, Lansing.

were carrying on a type of program which provided service to practically all other major health department programs.

Basic Record

The first step toward establishing the new system was to determine the type of basic record to be used. It was recognized that it must be a simple one in order to obtain complete and accurate reporting. This, together with the availability of IBM tabulating equipment in the department, resulted in the selection of the IBM mark sense card, designed to be used as the basic record for collecting and tabulating the data (fig. 1).

The fieldworker carries with him a small supply of these cards and a special IBM electrographic pencil. He records the services he gives by means of a few pencil marks on these cards; one card is used per activity according to the codes, all of which are indicated on the front or back of the cards with the exception of the geographic area code. Thus, only one code needs to be carried by the worker and since many workers provide services within limited geographic areas, they soon become familiar with their individual area code numbers. The completed cards are transmitted to the statistical methods section where they are mechanically punched in preparation for the required tabulations. Because mark sense cards are punched mechanically, their use eliminates the process of manual punching which would be required if any other type of record were used. However, where the volume of cards is small and IBM equipment is not available, the system is well suited to a marginal punchcard.

Information Recorded

This card provides for the recording of the following kinds of descriptive and identifying data concerning services:

Health department program (columns 25-27). Service consultants frequently provide services to more than one program during a single conference or other activity. For that reason, three identical program columns have been provided allowing for the recording of as many as three different programs served

during any one activity. For example, an individual conference is held with one person during which maternity, child health, and chronic disease problems are discussed. In this instance, the one person receiving service would be recorded as one in the "number in attendance" columns. In the program columns, all three programs are indicated; maternity would be marked in one program column, child health in the second, and chronic diseases in the third. However, there is no significance to the sequence of the three program columns; the marking of these three programs in any other sequence would be equally acceptable.

This method of recording makes it possible to obtain two types of counts; a count of total persons served without regard to programs and a count of persons served in each program. Machine tabulating procedures make it possible to count this person once in each of the three program columns and once in the total column (table 1). In other words, the total column refers to total persons served, some of whom may have been served in more than one program. Because a recipient frequently receives service related to more than one program, the sum of the persons served in each of the programs is usually greater than the total number of persons served. From these two types of counts, it is possible to obtain valid percentage distributions of services by program (table 4).

The geographic area (columns 19-21). The geographic code refers to the location of the recipient of the service. It identifies the following: individual counties, a few special cities, regions of the State, the State at large, the United States other than Michigan, and foreign countries.

The agency (column 18). Agencies with which the recipient of the service is associated are identified according to the local health department, hospital, private organizations, and other State agencies.

Personnel category (columns 16, 17). To record the work of the recipients, certain categories of personnel are identified by the code on the back of the card. Additions have been made as new programs have been included in the system.

Figure 1. Front side of mark sense card used by the Michigan Department of Health¹

										RECIPIENTS OF SERVICE										PROGRAM			
										MONTH	WKR.	ACTIV	UNIT	CATEGORY OF PERSONNEL	AGNCY	AREA		NUMBER IN ATTENDANCE	IDENTIFICATION WITH SERVICE				
																COUNTY	CITY		C D	C D	C D		
															L H D								
												CONF	INDIV		HOSP						MAT	MAT	MAT
												TALK	GROUP		INSTN						CH H	CH H	CH H
												INST			CR SCH					T B	T B	T B	
												INSP			COLLG					V D	V D	V D	
												TRAIN			WELF					CHR D	CHR D	CHR D	
												CASE			VOL AGNCY					DENT	DENT	DENT	
															INDUS					OCC H	OCC H	OCC H	
												GR STU			PRIV					ENV H	ENV H	ENV H	
												APPRN	OTHER		OTH ST AGNCY					GEN	GEN	GEN	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

MICHIGAN DEPARTMENT OF HEALTH

¹ The back of the card lists categories of personnel by numerical code.

Number in attendance (columns 22-24). Space is provided for recording as many as 999 in attendance or recipients of service per activity.

Activity (column 14). Activities have been classified in broad terms with the idea of making them applicable to all health department programs; they are conference, talk, institute (workshop), inspection, training, casefinding, and other. The number of each category of activity is obtained by a simple card count since one card is recorded for each activity. The number of people served by these respective activities is the sum of the numbers recorded in the columns for number in attendance.

Servicing unit (column 15). This column serves as a subdivision of the activity column and makes it possible to differentiate between individual and group activities.

Identification of service worker (column 13). The code used for the worker is a four-digit number representing the health department position which the worker is currently filling. Since this number remains constant until the position is abolished, the number does not change with a change in staff, and, therefore, gives continuity in reports. This number is so

constituted that the division, section, and unit of the department are identified by the first three digits, which are prepunched in specified columns of the cards leaving only the fourth digit for the worker to record to identify himself. This makes it possible to combine cards from all divisions of the department and still be able to identify the division, section, unit, and worker in tabulations of total health department services. Thus, a tabulation by program and the first three digits of the position number indicates the amount of service each division, section, and unit of the health department contributes to the total services in each program (table 2). Tabulations using the fourth digit of the position number provide summary tabulations of each individual worker's services (table 3).

Month of service (columns 11, 12). Only the month is marked by the worker; the last digit of the year is gang punched in a specified column for all program cards when received in the statistical methods section.

The items which have been discussed so far are believed to be applicable to all health department programs. For that reason, the terms used have been made as broad as possible.

However, some of the programs have certain types of services peculiar to their own programs which they also wish tabulated. We have reserved space for recording these items for the respective programs. One column is now used for special casefinding activities in the hearing program, and for special chronic disease information for nutrition and nursing. Other columns are used for hospital identification for the hospital consultation and the licensing section. This type of arrangement makes for uniformity, yet it is flexible enough to accommodate special program needs.

Purpose, Objective, and Philosophy

The purpose of this record system is to provide a feasible method of collecting these service statistics and a flexible means of tabulating them. The objective is to provide meaningful service statistics for program planning, administration, and evaluation which will be useful to the individual worker, the program director, and the administrator.

The system is primarily concerned with the recipients of health department services, the number of Michigan people and others who received service from the professional fieldworkers of the Michigan Department of Health. The number of recipients is a count of persons to whom services have been given and is not necessarily an unduplicated count of individuals. The item of activity as used here serves to indicate the method or means through which these services are accomplished. A count of these activities is not for the purpose of determining the amount of effort put into the job by each worker; instead, it is a means by which the amount of services accomplished can be related to the various work techniques, individual and group.

Only activities which provide services are reported in this system. For example, attending a professional meeting without participating is not recorded because no service was given. However, if there was participation in the meeting, then a service was given and the activity is recorded together with the number of people receiving the service. The first instance is for professional advancement while the second is a service given. Likewise, interdepartmental

planning conferences are not recorded; it is a foregone conclusion that effective services cannot be provided without previous planning and counseling. Also the time spent providing these services is of no concern in this system. When the time element is important, it can be considered more appropriately through special time studies.

Development

To establish the new system required several planning sessions over a period of time. In the beginning, several conferences were held between the chiefs of the nutrition section and the statistical methods section to determine types of data needed and the uses to be made of them. The statisticians met with the entire nutrition staff for an explanation of the philosophy and method of the new system. The staff assisted in defining terms and establishing rules for recording. Following this, the system was put into use. At the end of the first month, sample tabulations were run and summary tables prepared. These were jointly reviewed by the nutrition staff and the statisticians at the monthly nutrition staff meeting to which the director of the division of local health services and the director of the division of administration were invited.

Throughout the year, monthly tabulations were reviewed jointly with the nutrition staff at their monthly staff meetings. This continuing process provided a means of refining definitions and policies and developed a common understanding of the philosophy, problems, and methods of recording. At the end of the year, annual tabulations and summaries were prepared. Also, a few graphs were prepared showing the percentage distribution of nutrition services by program and by agency. This was the first time annual service statistics had been available on either a program or agency basis.

Again the directors of local health services and administration were invited for the review and expressed considerable interest in the value of these statistics to the department as a whole. The director of local health services said that the actual figure of total people served together with the subdivisions by program would be

useful in verifying the fact that the State health department had rendered specific services to certain individual health departments. The director of the division of administration felt that the figures by program would be useful in justifying categorical funds and helpful in making a more equitable distribution of them among the organizational units of the department.

At the end of the second year, annual summaries and charts were again reviewed. This time the charts were designed to compare the 2 years, keeping in mind, of course, the changes in size of staff. At the end of the third year, it was possible to prepare charts in the form of line graphs indicating trends and summary tables in the form of time series. At this point, it became possible to take a new look at the program from the standpoint of both the past and the future—in other words, to evaluate what had been done and set goals for the future. With 3 years' accumulation of data, the system took on new meaning and value for the program people.

During this period of development in the nutrition section, the director of the maternal and child health division suggested that this system be applied to some of her programs where a rather extensive code system of reporting was being used. Also, during this time, the system was reviewed by the Research and

Statistics Committee of the department composed of representatives of most of the health department programs. The representatives from local health services and administration were already familiar with its advantages and were helpful in conveying to the other members of the committee the advantages of the system to the department. The committee, including the director of the maternal and child health division, recommended that the system be extended to other organizational units. The director also suggested that the extension begin with three of her programs—hearing, vision, and hospital services. The statisticians then held meetings with the director of the maternal and child health division, her section chiefs, and staff members of these program units; these meetings were similar to those held with the nutrition section.

Not long after the system was underway in these programs, the chief of the nursing section requested that her program be considered next. Similar procedures of indoctrination were carried out with this section. Basically, the definitions and terms used for nutrition were acceptable to the other programs but needed to be related to the specific programs. It was obvious that the preliminary conferences and meetings with the nutrition staff were paying dividends. Relatively few changes have been necessary in the nutrition definitions and

Table 1. Report of nutrition services by agency and program, Michigan Department of Health, 1958

Agency	People served by program							
	Total	Communicable disease	Maternity	Child health	Tuberculosis	Chronic disease	Dentistry	Environmental health
Total.....	11, 448	11	1, 550	5, 743	122	4, 250	142	48
X Multiple agencies.....	24	0	0	24	14	24	10	0
0 Local health department.....	2, 043	4	211	837	58	1, 143	65	46
1 Hospital.....	962	0	252	141	25	220	0	0
2 Institution.....	656	0	0	208	0	474	0	0
3 Grade school.....	2, 918	0	2	2, 837	1	109	49	0
4 College.....	503	0	82	207	2	235	0	1
5 Welfare agency.....	178	0	5	88	1	93	0	0
6 Voluntary agency.....	389	0	72	37	3	113	2	0
7 Industry.....	1	0	0	1	0	1	0	0
8 Private.....	3, 362	6	863	1, 253	12	1, 629	16	1
9 Other State agency.....	412	1	63	110	6	209	0	0

NOTE: The column of numbers to the left of the agencies represents a numerical code used in tabulation.

Table 2. Report of certain health department services by program, Michigan Department of Health, 1958

Organization unit	Code	People served by program									
		Total	Communicable disease	Maternity	Child health	Tuberculosis	Venereal disease	Chronic disease	Dentistry	Environmental health	General
Total		45,650	307	6,121	34,854	547	118	5,940	196	118	10,893
Nutrition	350	11,448	11	1,550	5,743	122	0	4,250	142	48	2,702
Nursing	360	6,380	294	839	2,495	418	118	1,687	54	61	4,365
Maternity and child health:											
Hearing	343	18,118	0	0	18,118	0	0	0	0	0	0
Vision	344	4,685	0	4	4,667	0	0	0	0	0	59
Hospital services	346	5,019	2	3,728	3,831	7	0	3	0	9	3,767

procedures. The problems ironed out with that program reduced considerably both the problems and time required to establish the system in these other programs. However, successive

adaptations to new programs have helped to sharpen the definitions and to clarify policies for all programs. Trends are now available for all of the five programs and the annual sum-

Table 3. Nutrition services by worker, area, and program, Michigan Department of Health, 1958

Service description						Program								
Worker No.	Geographic area	Agency	Personnel	Activity	Unit	Total	Communicable diseases	Maternity	Child health	Tuberculosis	Chronic diseases	Dentistry	Environmental health	General
						2, 943	10	228	1, 891	58	1, 419	125	42	328
2	3	0	11	1	1	6			2		4			
2	3	0	13	1	1	9		4	6	1	1	1		
2	3	0	13	2	2	6					6			
2	3	0	15	1	1	3			1		2		1	
2	3	1	13	1	1	1					1			
2	3	1	21	1	1	3					3			
2	3	2	11	1	1	7					7			
2	3	2	11	2	2	3					3			
2	3	3	11	1	1	2			2					
2	3	3	21	1	1	2			2					
2	3	3	35	1	1	2			2					
2	3	5	11	1	1	1					1			
2	3	8	45	1	2	3					3			
*2	5	0	13	1	1	1		1	1		1			
2	5	3	21	1	1	3			3					
2	5	8	45	1	1	2		2						
2	6	0	13	1	1	2			2	1	1			
2	6	2	11	1	1	3					3			
2	6	3	21	1	1	12			12					
2	6	3	21	2	2	31			31					
2	6	3	34	1	1	1		1	1					
2	6	3	35	1	1	1			1					1

maries are becoming more and more valuable to the program directors each year.

Cross Tabulations of Data

Cross tabulations of the items in this system provide a wealth of information about health department services that have been given and call attention to the need for services where they have not been provided.

The cross tabulation of program and agency in table 1 shows the distribution of nutrition services to the various health department programs as well as to the several agencies. Similarly, for each program, there is a distribution of services by agency and for each agency there is a distribution by program. For example, the chronic disease services to 4,250 people represent well over one-third of all nutrition services; of these, 1,629, or 38 percent, were with private agencies; 1,143, or 27 percent, with local health departments; and 6 percent with colleges. Agencywise, hospitals received maternity, child health, tuberculosis, and chronic disease services as well as generalized nutrition services from the nutrition section.

Table 2 is a sample of a composite picture of health department services by program, the sum of the services contributed by each organizational unit. The sample includes the five organizational units currently using this system.

Table 3 gives a more detailed picture. It is a summary of the individual worker's services. From this, he knows how many persons he has served in each program by geographic area, agency, category of personnel, and by which method or activity these persons were served. For example, the line marked with an asterisk in table 3 is interpreted as follows: nutrition worker No. 2 held an individual conference with a local health department nurse in area 5 during which she provided service in relation to maternity, child health, and chronic disease.

Table 4 illustrates a continuing annual summary of the number and percentage distribution of nutrition services by program. The marked drop in services in 1954 is noticeable and was due to a decrease in staff. Since that time, some of the local health departments have employed nutritionists on their staffs with the result that fewer of the nutrition services to the State as a whole have been given by State-employed nutritionists. The increase in chronic disease service is also noticeable; this is the result of the recent responsibility of the health department for the licensing of nursing homes and homes for the aged.

Table 5 relates the number of activities to the number of people served and indicates the trend over the years. The services provided by means of conferences have consistently

Table 4. Recipients of nutrition services by program, Michigan Department of Health, 1953-58

Program	People served											
	1953		1954		1955		1956		1957		1958	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	14, 597	100	9, 706	100	11, 433	100	11, 880	100	11, 708	100	11, 448	100
Communicable disease	18	0. 1	16	0. 2	18	0. 2	0	0	5	0	11	0. 1
Maternity	328	2. 2	268	2. 8	381	3. 3	524	4. 4	602	5. 1	1, 550	13. 5
Child health	9, 277	63. 6	5, 377	55. 4	6, 818	59. 6	7, 528	63. 4	7, 547	64. 5	5, 743	50. 2
Tuberculosis	278	1. 9	347	3. 6	233	2. 0	115	1. 0	127	1. 1	122	1. 1
Venereal disease	0	0	0	0	0	0	0	0	1	0	2	0
Chronic disease	1, 477	10. 1	1, 063	10. 8	1, 356	11. 9	1, 456	12. 3	2, 695	23. 0	4, 250	37. 1
Dentistry	76	. 5	26	. 3	157	1. 4	28	. 2	26	. 2	142	1. 2
Occupational health	201	1. 4	0	0	0	0	2	0	2	0	0	0
Environmental health	72	. 5	152	1. 6	4	0	6	. 1	396	3. 4	48	. 4
General	4, 413	30. 2	3, 114	32. 1	3, 741	32. 7	2, 900	24. 4	3, 014	25. 7	2, 702	23. 6

Table 5. Activities and people served through nutrition services, Michigan Department of Health, 1953-58

Type of activity	1953		1955		1956		1957		1958	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Activity										
Total	2, 622	100	3, 072	100	1, 634	100	1, 635	100	2, 341	100
Conference	2, 164	82. 5	2, 789	90. 7	1, 326	81. 1	1, 381	84. 5	2, 035	86. 9
Talk	254	9. 7	143	4. 7	192	11. 8	147	9. 0	189	8. 1
Institute	65	2. 5	30	1. 0	27	1. 7	8	. 5	6	. 3
Inspection	135	5. 1	55	1. 8	65	4. 0	95	5. 8	82	3. 5
Training	2	. 1	39	1. 3	20	1. 2	2	. 1	27	1. 1
Other	2	. 1	16	. 5	4	. 2	2	. 1	2	. 1
People served										
Total	14, 597	100	11, 433	100	11, 880	100	11, 708	100	11, 448	100
Conference	3, 633	24. 9	4, 383	38. 3	4, 287	36. 1	3, 439	29. 4	3, 987	34. 8
Talk	7, 084	48. 6	5, 458	47. 8	6, 434	54. 2	7, 228	61. 7	6, 873	60. 0
Institute	3, 289	22. 5	1, 012	8. 9	882	7. 4	653	5. 6	247	2. 2
Inspection	532	3. 6	238	2. 1	153	1. 3	342	2. 9	138	1. 2
Training	10	. 1	325	2. 8	122	1. 0	9	. 1	98	. 9
Other	49	. 3	17	. 1	2	0	37	. 3	105	. 9

NOTE: Figures for 1954 not available.

ranged between 80 and 90 percent of all activities, serving between approximately 25 and 38 percent of the people. Although not shown in this table, it is possible to subdivide conferences into "individual" and "group" to further relate the activity to persons served and to indicate the amount of group approach.

Figure 2 shows the number of recipients of the various program services on semilogarithmic graph paper which indicates not only the relationship between the number of services in the several programs but also the rate of change in the number of services in each of the respective programs. The drop in tuberculosis services during 1955 and 1956 alerted the nutrition staff to the need for conferences with the staff of the tuberculosis division.

Uses

These service statistics are used for—

- Special program reports.
- Staff meeting discussions.
- Program reviews, evaluations, and planning.
- Developing and administering training programs.

In order to—

- Orient new employees.
- Write annual reports.

Point up areas for special studies and special program emphasis.

Justify increased budget and staff; distribution of categorical funds; and reorganization of program plan.

Indicate areas of progress and of need.

Evaluate local use of State consultants.

Determine services provided in areas of the State without health departments.

Provide information to legislative and budget authorities.

Monthly and annually, the program director receives a copy of the tabulation of total staff services and a copy of each individual worker's services. The individual worker also receives a copy of the total staff services but only a copy of his own individual services, not those of his co-workers. It is important that the individual worker receive a report of his services to provide him with the means of evaluating and planning his own work, as well as to receive something valuable and useful in return for his efforts of recording data. This makes him better able to see his services in relation to the total services of his organizational unit, a factor conducive to the team approach.

Reviewing monthly and annual summaries at

staff meetings is very valuable to the individual worker as well as to the program director because each worker has an opportunity to see the overall result of the combined efforts of the staff as well as his own contributions. This type of review also frequently serves as a self-correcting device. It is not uncommon for questionable figures to appear and after some discussion, it is discovered that there is lack of uniformity among the staff in recording their services. For example, it was learned that for services in nursing homes, some workers were coding them as "private" and some were coding them as "institutions." These examples of misplaced data due to miscoded reports are of tremendous assistance to the worker in helping him to more fully understand the categories of information which he is asked to code on the record. Knowing where he wants his efforts to appear in the

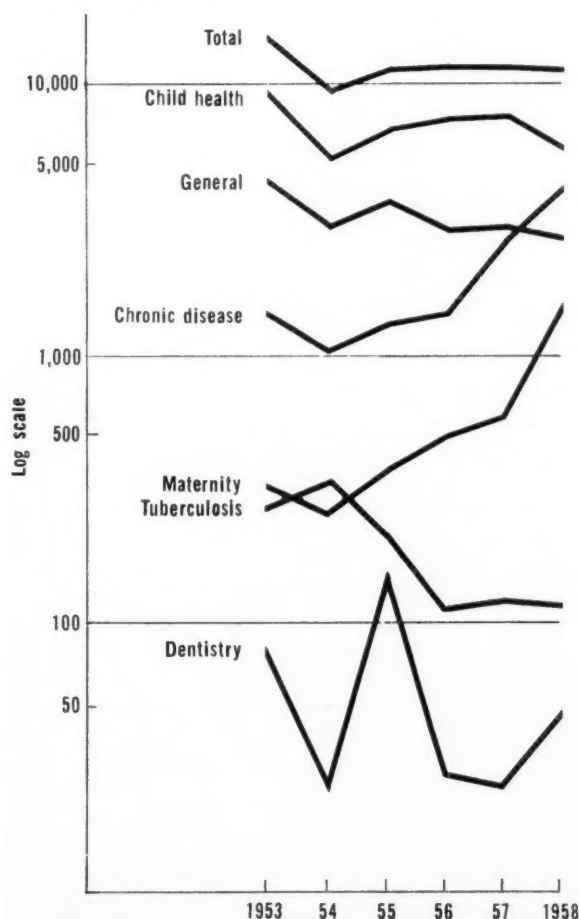
summary reports helps him to code his services more accurately.

These continuing annual summaries provide the program directors with data helpful not only for future planning but also for deciding emphasis in program operations. After 2 successive years of decreasing nutrition services to the tuberculosis program, the nutrition section assigned a graduate nutrition student the project of determining the reason for the decline in tuberculosis services and also to discover where these services were most needed in the program. This information also served as the basis for joint conferences with the tuberculosis and adult health division to review their total program with special concern for nutrition emphasis. This created an awareness of the services available from the nutrition section.

The nutrition section also makes extensive use of this information in State and local training programs. Their graduate students and trainees in local health departments also use this system to record their services and send them in to the State office, thus providing actual figures which are convincing evidence that trainees give a great deal of service while they are being trained. These factual data indicated that the nutritionist provides a departmentwide service to the local health department programs, thereby justifying the expenditure of money to establish a nutritionist position on the staff. So far, two local health departments have established nutritionist positions on their staffs. One of the local health officers requested from the State the service statistics of his nutritionist to include in his annual report.

The fact that the State health department also has the statistics from the local areas makes it possible to evaluate not only the nutrition services of the State staff but to have information concerning total nutrition services given within the State, by State and local health departments. In other words, the system provides a means of both selling and evaluating. More and more graduate schools are becoming concerned with training for supervisory nutrition positions. To date, three students have come to Michigan for supervisory field training. The interpretation and use of this system provided the basis for the most important part of

Figure 2. Number of recipients of nutrition services by program, Michigan Department of Health, 1953-58



their training. It is a concrete constructive device to use in training and supervision and a tool which they can use in the future.

The first annual summary of the hearing program pointed up the volume of casefinding services and the proportionately small amount of consultant service. The maternal and child health director and hearing consultants had been aware of this situation and realized that consultants on the State level should provide more consultant service and do less casefinding. A bar diagram chart of these services pointed up the relationship very sharply and gave support to the hearing program's long-range plan for decentralization. Plans were made for further decentralization of casefinding activities. This resulted in many local health departments employing hearing conservation staff.

Comments

Comments have been received from two program directors using this system to the effect that because they are accustomed to working with and thinking in terms of individuals, it is hard for them to think in terms of large numbers. This is particularly true of some of the people trained in the clinical field. They recognize the need for service statistics but find it difficult to know how to record them or how to think in terms of counting them. Once these data are summarized, related to each other, and presented in such a way as to indicate trends

over the years, they can readily relate past incidents and problems of their programs to the fluctuations in these trends. With this visual impression of the past, they can more readily visualize their future goals. Also, they are much more aware of the relative position that each part of their work contributes to their total program and are able to adjust their activities and program content according to their goals; for example, the people in the hearing program further decentralized their casefinding activities and the nutrition people took steps to increase their services to the tuberculosis program.

Summary

As the scope of public health takes on new proportions, the number of public health disciplines increases and, consequently, a greater need arises for service statistics by program for health departments as a whole as well as by specific divisions within the department. These statistics are valuable not only for program planning and evaluation, including training programs, but as documentary evidence for budget requests, justification of categorical funds, and as an aid in making an equitable distribution of services and funds.

This account describes the development and use of a mark sense punchcard system for obtaining service statistics. With this system, collection of the data is simple and the tabulating possibilities are both multiple and flexible, providing useful information for the individual worker, program director, and administrator.

Safety Leaflet for the Aging

"Getting on Safely," a leaflet to help aging men and women to avoid accidents, was recently published by the National Safety Council.

Among men and women over 65 years of age, the incidence of fatal and crippling injuries is relatively high. Three-fourths of all accidental deaths from falls during 1957 occurred in this age group.

A sample copy of the leaflet may be obtained free of charge from the National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill. The minimum purchase order accepted is for 50 copies (\$2.80).

Public health nurses discover an outbreak of staphylococcus in a New York State hospital nursery through a 10-month surveillance of newborn infants at home.

Staphylococcal Outbreaks in Infants Detected after Hospital Discharge

ANDREW C. FLECK, Jr., M.D., M.P.H., and MALCOLM BOUTON, M.D., M.P.H.

IN HOSPITALS in upstate New York, most newborn infants stay only 4 days. Since this stay is shorter than the average 6-day incubation period of hospital-acquired staphylococcal disease in newborns (1-6), a nursery outbreak may be detected only by examination of infants after discharge.

The feasibility of having public health nurses examine infants after discharge was explored during a 10-month survey in one city served principally by three hospitals. When the survey began in May 1958, there was no reason to believe that any of the hospitals had a staphylococcal disease problem in their nurseries.

The city's resident population was 97,999 on July 1, 1958, as estimated by the New York State Department of Health. Its 3 hospitals, which also serve the surrounding suburban and rural areas, have nursery units with a maximum capacity of 12 bassinets in each unit. The nurseries are not overcrowded, and they were inspected and approved during the preceding year as complying with the provisions of the

New York State Sanitary Code. This code establishes standards for physical features and nursing and medical management of nurseries. The three hospitals are identified here as "A," "B," and "C."

Methods

The public health nurses employed by both official and voluntary agencies were told the purpose of the study at a series of meetings.

No effort was made to select a random sample of infants or to add to the current caseload of the visiting nurses. Infants were already being visited as part of the maternal and child health program. The policy was to visit all infants of primiparae within 1 to 2 weeks after birth. The nurses were asked to take a history and record their observations of the presence or absence of pustules, vesicles, bullae, and other types of skin infections. Information recorded for each infant included the nurse's description of the skin infection and the date of the nurse's visit, in addition to the infant's name, date of birth, and hospital of birth.

An infant was classified as positive on the basis of a history or presence of skin pustules or more severe suppurative disease. Suppuration was felt to be a more specific index of staphylococcal disease than the vesicular bul-

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lous, erythematous, or papular rashes which are fairly common in the newborn. Suppuration was also more easily identified and described by the mother and the nurse.

A preliminary analysis was made to determine the relationship between the age of the infants at the time of the nurse's visit and the possible dates of onset of staphylococcal disease. Of 344 routine neonatal visits during a 3-month period, 316 visits were made between the 6th and 20th day following birth; 177 of these were made between the 9th and 12th day. It was felt that this timing was optimal, since our previous experience in New York State nursery outbreaks had shown that the onset of pyoderma occurred most commonly before 10 days of age (1). It was recognized that some cases which have longer incubation periods, such as breast abscess or pneumonia, might be missed.

Outbreak Findings

The attack rates for each hospital for the entire survey period were not significantly different (see table). The salient finding was the detection of a previously unidentified outbreak of staphylococcal disease in a sample of the newborn infants discharged from hospital B. The presence of an epidemic was suspected when 2 infants among 13 born in hospital B during the first week of November were discovered through the survey method to have signs of suppurative disease.

Neonatal suppurative disease in a sample of discharged hospital-born infants examined by public health nurses, May 1958-February 1959

Hospital of birth	Estimated total births	Number of infants visited	Number ill	Percent of sample ill
A-----	1, 150	157	3	1. 9
B-----	1, 530	391	12	3. 1
C-----	800	56	3	5. 3
Other ¹ -----		6		
Total....	3, 480	610	18	2. 9

¹ Resident births in hospitals in other cities.

NOTE: $n=2$, $\chi^2=1.66$

The suspicion was confirmed when subsequent visits to an enlarged sample of 46 infants born in this hospital discovered 6 infants with signs of suppurative disease. The suspect diagnoses were confirmed by a physician's examination. Phage typing identified the etiological agent isolated from the lesions as type 80/81 staphylococcus. Examination of all 233 infants born in hospital B during the epidemic period revealed a total of 20 cases of suppurative lesions including 1 death, and an attack rate of 8.6 percent. The types of clinical disease discovered are shown below:

Lesion	Number of infants
One or more skin pustules-----	11
Impetigo -----	4
Omphalitis -----	1
Conjunctivitis -----	1
Abscesses -----	2
Septicemia -----	1

The epidemic occurred in a 55-day interval November 1 to December 25, reaching its peak in 30 days and declining in 25 days. One mother developed a breast abscess.

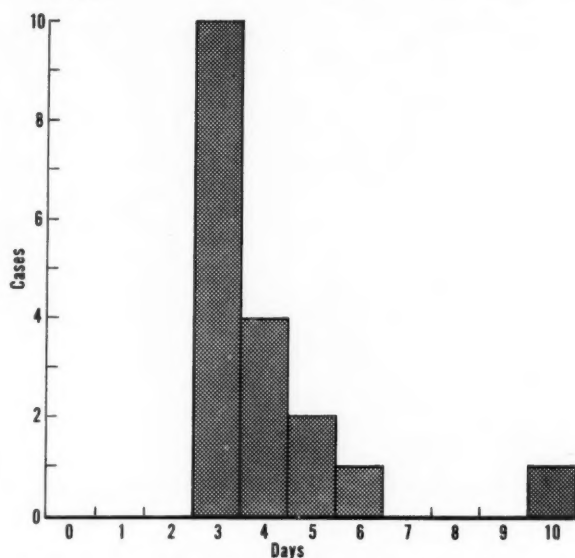
The only death occurred in an infant born November 18 who developed pustules on the buttocks 4 days following birth, an upper respiratory syndrome after 1 month, and died with a type 80/81 staphylococcal septicemia when 8 weeks of age.

Excluding two premature infants with prolonged hospital stays starting before the epidemic period, the range of incubation period, as measured by the interval from the birth-date to the onset date of disease, was 2 to 10 days. The distribution of incubation periods is consistent with a common source outbreak (see chart). The modal incubation period was 3 days.

A bacteriological and phage-typing survey of the nares of personnel and infants ruled out both an infant nasal reservoir of type 80/81 staphylococci and carriers among hospital personnel working in the nursery. Nasal cultures were taken from 30 persons. Six persons were found to be carriers of coagulase positive strains, but none had the epidemic strain.

Two nurseries, equally affected, were on separate air supplies. A common airborne source such as dust or droplet nuclei was believed to

Interval in days from birth date to onset date of staphylococcal disease, hospital B epidemic cases¹



¹ Data exclude two cases of premature infants born before epidemic period.

be unlikely. One nursery contained only isolate units and the other, conventional single infant bassinets of an approved design. The equipment used in the two nurseries was different and a common fomite source was also considered unlikely.

A source lesion among nursery personnel and a resulting spread of staphylococci by direct contact was suspected. However, physical examination of all personnel in contact with the nursery, conducted by hospital staff physicians, did not reveal any source lesions.

The reasons for the cessation of the detected epidemic were not discovered. Two factors may have been involved: the special attention given to aseptic principles as a result of the concern of the staff about the outbreak, or the spontaneous recovery or departure from the nursery staff of a worker with an unrecognized lesion discharging staphylococci.

Other Findings

In addition to the detected epidemic, examinations by visiting nurses provided an estimate of the nonepidemic levels of suppurative disease. Exclusive of the epidemic period in hospital B, 12, or 2.1 percent, of 564 infants visited

after discharge from the three hospitals were found to have evidence of suppurative disease. Of the 12 cases, 9 had only few or solitary skin pustules, 2 were classified as impetigo, and 1 had a purulent conjunctivitis. No bacteriological studies were made on these infants.

The nonepidemic level of infant suppurative disease, 2.1 percent, observed in this survey of primiparous births differs from that reported in the literature. Williams (7) reports endemic levels of 5 to 15 percent based on daily hospital observation of newborn infants for evidence of pustules, conjunctivitis, or other suppurative disease. Ravenholt (8) conducted a telephone survey of a sample of infants born in a hospital. Excluding 1 hospital with an epidemic, he found a pyoderma attack rate of 15.5 percent in a sample of 642 newborn infants discharged from 12 hospitals. Other investigators have found nonepidemic attack rates for infant pyoderma ranging from 5.5 percent to 22.0 percent, with most attack rates falling between 13 and 17 percent (9-14).

Aftermath

The survey technique using public health nurses is being followed in 12 counties in New York State, where 2,472 infants have been examined during the period July 1958 to April 1959. Eighty-three infants, or 3.3 percent, were observed to show evidence of suppurative disease.

This lower level of suppurative disease may be attributable to the enforcement of regulation 35 in chapter II of the New York State Sanitary Code, entitled "Precautions To Be Observed for Control of Diarrhea of the Newborn." Annual inspection of nurseries and adequate enforcement have eliminated to a great extent the hazards of overcrowding, neglect of handwashing, and other factors which encourage contact transmission of any communicable disease.

Conclusion and Summary

The rationale of the examination of infants after hospital discharge as a means of detecting nursery outbreaks of hospital-acquired staphylococcal disease is based on the assumption that

the incubation period is longer than the hospital stay. This study demonstrated that the technique will be applicable, even when the modal day of onset of disease coincides with the next-to-the-last day of hospital stay. In practice, minor pustular manifestations are not considered as a barrier to scheduled discharge. The removal of the cases from the hospital forestalls the detection of an epidemic unless someone initiates an intrahospital reporting system which can be used to develop data on attack rates of suppurative disease.

Surveillance of infants by public health nurses for evidence of suppurative disease after hospital discharge detected an outbreak of the disease in a hospital in one city. Exclusive of this outbreak, the nonepidemic level of staphylococcal disease in infants measured by the presence of suppuration was 3.3 percent in a group of 2,472 infants visited in 12 counties in New York State, and 2.1 percent in a group of 564 infants visited in 1 city.

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Epidemiology Course for Nurses

A refresher course in communicable disease control, emphasizing epidemiological and statistical principles and techniques in terms of major communicable diseases, will be held from February 29 through March 18, 1960, at the Communicable Disease Center in Atlanta, Ga.

Communicable disease nursing consultants, public health nursing supervisors, educational directors, qualified public health staff nurses, industrial nurses, instructors in schools of nursing, and other nurses having supervisory, teaching, or consultant functions are eligible for admission.

Application forms and further information can be obtained from the Chief, Nursing Section, Epidemiology Branch, Communicable Disease Center, Public Health Service, 50 Seventh Street NE., Atlanta 23, Ga., or from the directors of public health nursing of State health departments. Applications should reach the center no later than February 8, 1960.

Trends in the Care of the Mentally Ill

ROBERT T. HEWITT, M.D.

RESPONSIBILITY for care and treatment of the mentally ill is moving out from the mental hospital into the community, the outpatient clinic, the general hospital, the physician's office, and the home. There seems to be no immediate danger of the public mental hospital going out of business. However, there are indications of many efforts to find out what is the place of the mental hospital in the changing treatment picture.

As evidence has unfolded to indicate that the traditional mental hospital is not the most appropriate place to treat all mental illness and that the hospital itself may be a factor in the development of chronicity, statements have been made that "The mental hospital must go." More moderate opinion has been concerned with the need of modifying the old but also with developing other and hopefully more effective means of meeting the situation. The experiences of World War II, the advent of the tranquilizing drugs, studies of social scientists in mental hospitals, an aroused public conscience, and increased governmental interest—local, State, and Federal—have all been cited as responsible catalysts in the reaction.

Grants from the National Institute of Mental Health, Public Health Service, known as mental health project grants, are specifically designed to support projects for the development of new and improved methods in the areas we are discussing. These projects are pilot projects, experiments, demonstrations, and studies. The Office of Vocational Rehabilitation is also supporting projects in rehabilitation of mentally ill persons.

Mental illness is often precipitated by a crisis in the family, on the job, or elsewhere. Appropriate treatment given in an appropriate manner and at the appropriate time will often re-

store equilibrium, though not necessarily cure the patient of basic personality problems which make him prone to such crises. However, it may be possible for him to continue at home and at work without interruption or with minimal disruption. Commitment and hospitalization may be unnecessary and may make the total problem worse by disrupting the social and family situation. Like idleness enforced on muscles by immobilization of a limb, hospitalization results in some atrophy or regression with consequent prolonged recovery and more chance of developing chronicity. Of course, the nature of the illness may make hospitalization, even for long periods, the treatment of choice, but it has been shown that frequently it is not necessary. It has also been shown that hospital programs can be planned so that even the long-term patient is helped to reach his maximum level of functioning.

A corollary is that if social and family ties are not to be weakened, the patient should be treated as near home as possible, even if hospitalized. Also, if the patient is to avoid chronicity and relapse, rehabilitation and aftercare are necessary.

Alternatives to Hospitalization

Many of the new methods being tried out are called alternatives to hospitalization. While they are usually looked upon as substitutes for care in a mental hospital, they are steps toward

Dr. Hewitt is psychiatrist, Community Services Branch, National Institute of Mental Health, Public Health Service. This paper was delivered during the meeting of the State and Territorial mental health authorities in Washington, D.C., March 11-13, 1959, and appears in the proceedings of the meeting.

developing care and treatment methods which are appropriate to the illness and situation of the patient. They also represent an effort to achieve continuity of care throughout the different stages of a patient's illness. They are, for the most part, experimental and the subject of study at the present time. Very possibly in the future they may become essential elements in effective and comprehensive treatment programs. Many hospital administrators and others are convinced that construction of facilities for the care and treatment of the mentally ill must and will be modified in the light of the knowledge developing from current experimentation with these methods.

Some interesting projects are being developed to explore the ways in which early treatment can be provided in the acute phase of an emotional disturbance. Exploratory work is being done on the feasibility of establishing treatment teams available at any time to go out into the community to see patients immediately when a crisis arises which involves an emotional disorder. This is not only for the purpose of treating a patient early in his illness but is also based on the idea that the person did not become ill in a vacuum and it is necessary to see him in his own home or job situation to assess the environmental factors involved. Recommendations may be made or action taken which may involve referral to a nonpsychiatric agency, referral for treatment to a physician, an outpatient service or a hospital, or further diagnostic study by the emergency team.

A variation of this approach being explored is seeing each patient immediately as he comes to the outpatient department or the clinic, along with his family whenever possible. Here also an attempt is made to understand the problem in its psychological and social ramifications and to take action as quickly as possible. This is contrary to a familiar pattern of placing people on a waiting list for later consideration. It is hypothesized that many problems can be solved quickly and more efficaciously if attacked when acute and that a waiting list is not necessary. In many situations long-term psychotherapy is not desirable or required. Family counseling, environmental manipulation, or physical therapy may be the treatment of choice. There is evidence that conventional psychotherapy is not

suitable or effective in some socioeconomic groups.

Basically, day hospitals are outpatient departments, modified to fit the mentally ill patient. Patients are in the hospital for a varying number of hours during the day and then return home. The conventional outpatient treatment of 1 hour a day, successful with many mental patients, is not enough for the psychotic patient or for many neurotic patients. Diagnosis, treatment, and rehabilitation are functions of the day hospital. Various kinds of therapeutic activities may be added. These hospitals are usually open 5 days a week. Some patients may have daily appointments and some may come only when they feel the need. Day hospitals for children may be organized as schools with treatment of emotional disorders added. Others are organized as child guidance clinics with the school added.

Night hospitals are operated for patients who work during the day. They spend the evening and night at the hospital.

Many types of programs make use of the "halfway house." It is intended to be a transitional domicile for patients who do not require further hospitalization but are not yet ready to resume independent living. They live with other patients under some supervision in this transitional dwelling, moving gradually back into the community by reestablishing relationships through employment, social and family activities, and recreation.

This is a broad description of halfway houses. In practice they vary a great deal in organization, program, and auspices. For example, one halfway house is established specifically for the purpose of finding work for patients. Another provides not only supervision and social activities but also psychiatric treatment. Halfway houses in the community may be organized under official or voluntary auspices. Some are developed under the supervision of the mental hospital and may even be located in a ward of a mental hospital. In such cases the hospital regulations are liberalized with regard to this ward. Patients are placed more on their own responsibility with regard to movement in and out of the hospital and their activities within the hospital. Definite rehabilitation programs are organized for

them and they are encouraged to step out into the community.

Social clubs for ex-patients may be organized and supervised by professional people or they may be organized by ex-patients themselves. They attempt to provide some social life for ex-patients and in many instances offer counsel and advice as to sources of help: social, medical, and vocational. Some halfway houses are not residential facilities but in actuality are social clubs.

Followup and aftercare services for mentally ill patients discharged from hospitals are being extended. We need studies to help in planning the type of these services to develop. For example, how many and what kinds of patients want or need these services? What services may best be offered by the hospital or by the clinic? What should be provided by the official and voluntary health and welfare agencies in the community? It is generally agreed that a coordinated effort is a prime necessity. The public health nurse, the social worker, the vocational rehabilitation worker, the practitioner of medicine, and many others have a role to play just as they do in other human problems.

General Hospitals and Community Centers

Twenty years ago there were 48 general hospitals in the United States treating psychiatric patients. Now there are 500 to 600 with psychiatric units. Many others accept mentally ill persons for short-term treatment. This has been both a cause and a result of more psychiatrists moving into practice in communities. Factors in this trend have been the improvement in treatment techniques, the increased experience and confidence of psychiatrists that patients can be treated in general hospitals, and the increased understanding and leadership of hospital administrators. The length of hospitalization is usually short and no commitment is involved, so that there is less social disruption for patients and their families. Patients are often more amenable to the idea of going to a general hospital than to a mental hospital, and their attitude is frequently more favorable for treatment. Several States are experimenting with subsidizing the care and treatment of patients in the psy-

chiatric wards of general hospitals. These wards are for patients who would ordinarily be admitted to State mental hospitals. In other places attempts are being made to admit all mentally ill persons from a specific area to a psychiatric service to determine the feasibility of such care for all mentally ill.

Many psychiatric services are so large that they really operate as mental hospitals under the administrative umbrella of a general hospital. In other general hospitals, psychiatric patients are hospitalized with general medical patients and there are no separate wards. Without discussing in detail the advantages and disadvantages of treating patients in general hospitals, we already have abundant evidence that we should continue to move ahead in developing psychiatric services in these hospitals. We need to study the possibility of integrating care and treatment of the physically and mentally ill just as we need to appreciate that there are unique aspects to each.

Community mental health centers are conceived of as places where all mental health services, including prevention, promotion of mental health, consultative services, treatment, and aftercare services can be centralized. Treatment services may include all of those already mentioned. Experimentation with these centers has occurred mostly in urban areas. It is hoped that they will provide for the coordination of mental health services so difficult to achieve.

Mental Hospitals

Today there is generally a more hopeful atmosphere in mental hospitals. Although admissions are increasing, the total number of patients in our State mental hospitals has been decreasing slowly in the last few years. We do not know the meaning of these decreases as both discharges and deaths have increased. There is increased emphasis on treatment and rehabilitation which was additionally stimulated by the advent of the tranquilizing drugs. Studies of social scientists have pointed out that the hospital organization and procedures may promote chronicity. This has resulted in renewed efforts to discharge patients as soon as possible and to design rehabilitation programs for the patients who remain longer.

A recognized first step in producing a therapeutic community is to be sure that you aren't doing anything antitherapeutic. Most authorities, here and abroad, feel that the large mental hospital can be just that. We can't tear down these hospitals tomorrow, but we don't have to make the same mistakes in building new hospitals. Also, we can make important modifications in existing hospitals. Modern treatment ideas call for dividing hospitals into small treatment units so that the personnel and the patients can develop a close relationship and understanding. These units are being established in many older hospitals. This trend must be taken into consideration in planning new construction.

The increased emphasis on the therapeutic use of personnel and other treatment innovations, including the tranquilizing drugs, have made a great difference in the care of the so-called disturbed patients. Episodes of disturbed behavior occur but are treated more effectively. The old "disturbed" ward is almost gone. In hospitals of the future, security will be a minor issue as compared to what it has been in the past.

This brings us to a discussion of the open hospital. The idea of a completely open hospital began abroad and has many supporters in this country. Even though the open hospital movement has proceeded more slowly in this country than in the United Kingdom, the philosophy that patients are able to respond positively to more freedom has resulted in the unlocking of more wards throughout the country. Protagonists of the open hospital idea say that it reduces administrative problems and improves the attitudes of patients and personnel. They maintain that it is unnatural to lock patients up; that locked doors are a cause of a good deal of disturbance and chronicity in mental patients. It is evident that allowing patients more freedom makes it imperative to provide activities for them. It stimulates a reorientation of attitudes on the part of personnel and also has implications for hospital construction.

Planning of facilities must be preceded by good program planning if we are to avoid having programs determined by the kind of facilities available. The isolation of mental hospitals from physical care facilities, training

sources, and community health and welfare agencies, both physically and psychologically, has impeded the development of mental health programs. This calls for mutual study and planning.

The Aged

All States are grappling with the problem of the aged mentally ill. It is alleged that there are many aged patients in mental hospitals who really should be in their own homes, in nursing homes, or homes for the aged. This is one of our unsolved problems and we need more facts to deal with it. Just how many aged patients in mental hospitals could be cared for adequately in homes for the aged?

People who have been working with the aged believe that here, more than in any other age group, coordinated planning by those responsible for physical and mental health and welfare is necessary. The idea that aged patients once admitted to a mental hospital must die there has been discredited. Many older patients have transient psychoses, such as depression, which yield to treatment, both physical and psychological. Many of them require brief periods of hospitalization and then can go back to their own homes, or to nursing homes. Much more study and collaboration are needed in planning programs for the aged.

In Conclusion

What are some of the factors which we need to think about in planning for the future? The care of the mentally ill has been traditionally State supported and provided on a mass basis in large mental hospitals. But will this be the pattern for the future? I have indicated that there are alternatives to sending all mentally ill patients to mental hospitals and that short-time treatment in general hospitals is feasible for many patients. Vocational rehabilitation has made forward strides in the rehabilitation of the mentally ill in the last few years. In many places health insurance programs have extended coverage to some area of mental illness and studies are being initiated at the present time to investigate the cost of further coverage. Some union medical care plans are underwrit-

ing both treatment in general hospitals and outpatient treatment. Resources from social security benefits are available to an increasing number of persons. Patients and their families will be more able to carry the cost of short-term care if they are helped by insurance and if

treatment facilities are conveniently available to them. All of these factors must be taken into consideration in thinking about our total problem. They make clear the need for coordination in planning mental health facilities for the mentally ill.

Legal note . . . Sanitation

Sanitary district liable for property damage when clogged manhole caused sewage to back up and overflow into home. Duty of proper inspection of sewer lines. *Mulloy v. Sharp Park Sanitary District* (164 Cal. App. 2d 391, 330 P. 2d 441, October 1958).

Plaintiff brought an action for damages against the defendant sanitary district, alleging that the district created a private nuisance and was guilty of negligence in allowing a manhole of the sewer system operated by it to become clogged, causing the plaintiff's home to become flooded with sewage and debris. On appeal by the sanitary district, a jury verdict in favor of the plaintiff was upheld by the California District Court of Appeal.

The facts, as stated by the court, were that the district operated a sewer system consisting of a sewage collection system and a treatment plant. The system had about 500 manholes, and 1 manhole was located directly in front of the plaintiff's home, which was connected to the sewerlines.

On the day in question, when plaintiff flushed a toilet, water backed up in the toilet and bathtub, flooding the bathroom and other rooms in the house with about 4 inches of sewer water and debris, causing extensive damage.

When the defendant's employees were called, they found the manhole plugged and full of water. They dislodged a broom or mop from the sewer pipe connected to the manhole and there was evidence that there was other debris in the manhole.

The defendant's evidence indicated that all the manholes were routinely inspected about every 30 days. The manhole in question had been inspected the day before the occurrence complained of and no obstruction of the sewer was seen at that time. The inspectors, however, had not descended into the manhole but had merely lifted the cover and looked down, a process which took about 1 minute.

The defendant's superintendent also testified that it was good practice to conduct occasional flushings and cleansings of sewerlines, but the defendant did so only when the lines were obstructed. The line serving the plaintiff's home had not been flushed prior to the flooding.

The district contended that, as a public agency engaged in a governmental activity, it could not be held liable in the absence of a special statute. The court rejected this contention, holding that in California a governmental unit is liable for creating and maintaining a condition declared to be a nuisance by the legislature. Under the statutory definition of nuisance contained in section 3479 of the California Civil Code, as "Anything which is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property . . .," the court held that the facts in the case unquestionably constituted a nuisance.

Disposing of the district's argument that it could not be held liable for negligence, the court held that under the decided California cases a governmental agency was liable for negligent damage to real property. The limited inspection of the manhole, the court declared, supported an inference of improper inspection of the sewer system and upheld the finding of the jury that the district was guilty of negligence.

—SIDNEY EDELMAN, *assistant chief, Public Health Division, Office of General Counsel, Department of Health, Education, and Welfare.*

Occupational Health Notes

Sporotrichosis Among Miners

Mature spores of the fungus *Sporotrichum schenckii* in mine timbers afflicted more than 3,000 miners with skin lesions and internal damage before the source was detected and controlled, reports Dr. Rebecca Brown, Transvaal Chamber of Mines, Timber Research Laboratory, Johannesburg. She was in Montreal at the Ninth International Botanical Congress.

Castor Bean Pomace

Castor bean pomace, imported from South America for use in fertilizer, has caused outbreaks of illness in workers handling the material at eastern seaports. The pomace, which is the residue after oil is extracted from the castor bean, has long been recognized as capable of producing illness since it contains a powerful toxin, ricin, and a potent allergen.

An outbreak in Baltimore in February 1959 affected 18 of 45 railroad workers. Symptoms were upper respiratory distress, asthma, nausea, vomiting, chills, and fever. The Public Health Service found that similar incidents had occurred in Norfolk, Va., Wilmington, Del., and Tampa, Fla.

Recommendations to importers included steam treating, improved packaging and handling, and the use, where necessary, of protective clothing, eye protectors, and respirators.

Insecticide Hazards

Two young market garden workers in Massachusetts died as the result of insecticide poisoning. Over several days they had spent about 12 hours applying various kinds of insecticides including parathion. On the day they died, they worked the entire day dusting turnips with a powder containing 1.5 percent parathion. They used knapsack dusters. They became ill about 5 p.m., and 2 hours later were taken to the local hospital where atropine therapy was administered. Autopsies were not per-

formed, but the symptoms of the men were typical of organic phosphate poisoning.

The workers reportedly had been informed of the hazardous nature of the insecticide but were not required to wear respirators and protective clothing, although the equipment was available. The bags of insecticide carried warnings of toxicity but were not labeled "poison" and had no statement as to antidote or treatment.

Explosion in a Plastics Plant

Lack of proper identification on containers was the basic cause of an accident which took one life and extensively damaged a plastics plant compounding polyester resins.

Assigned to clean up the crib where materials were mixed, an inexperienced employee of the Michigan plant tried to consolidate two half-filled gallon jugs which he believed contained the same material. One jug contained DDM (methyl ethyl ketone peroxide in dimethyl phthalate); the other, cobalt naphthenate. An explosion and fire resulted.

The worker received burns over 95 percent of his body and died about a week later. Plant damage from fire was at least \$100,000.

State Radiation Regulations

The Kentucky State Board of Health has adopted comprehensive radiological health regulations, and the Tennessee State Industrial Hygiene Service last summer began registration of radiation sources, in accordance with the Radiological Health Service Act.

Compensation for Radiation Exposures

Ionizing radiation exposure may result in physical injury, wage loss, and possible limitation of the employee's capacity to continue to work. All these effects, weighed for workmen's compensation, may not be evident for years after the guilty exposure. Donald Ream, consultant to the U.S. Bureau of Labor Standards, stressed particularly the time factor at the First Annual Governor's Conference on Workmen's Compensation in New Jersey, saying that a rating should permit continuing evaluation. He told of 35 workers reported by the U.S. Atomic Energy Commission as having received the "maximum" radiation dose but who might not evince outward symptoms for years.

Despite unchanged attitudes, the majority of the recalcitrant tuberculous patients discharged from the California Medical Facility during a 6-year period generally remained under medical supervision, and the disease of more than half of them became inactive or probably inactive.

Followup of Tuberculous Recalcitrants

EDWARD KUPKA, M.D., and DOROTHY L. GIBSON, P.H.N.

PRIOR to 1949 local health departments in California, except in Los Angeles County (1), frequently had difficulty in enforcing the isolation of infectious tuberculous patients who refused to cooperate. It was usually difficult to make sure that home isolation was being maintained; few county hospitals had facilities for escapeproof custody; and local jails generally were unsuitable for the detention of a person with infectious tuberculosis. Although the uncooperative tuberculous were a very small proportion of the total number of known patients, each was an unquestioned hazard to community and family and absorbed a disproportionate amount of the time and effort of health department workers.

Enactment of specific laws dealing with tuberculosis by the California Legislature in 1949 encouraged new approaches to the difficulties. These laws designated the disease as a public health menace; defined in detail the responsibilities of the health officer and other law enforcement officials in tuberculosis control; and specified the powers and duties of the health officer in enforcing isolation of infectious cases (2).

The legislation empowered the California State Department of Public Health to establish a hospital unit for recalcitrant patients to which violators of isolation could be sent by

the courts. The law also protected tuberculosis patients against indiscriminate incarceration by stipulating that the health officer must be ready to present evidence at court to verify the hazard of the individual's disease to the community.

With the cooperation of the California State Department of Corrections, a 20-bed unit with both hospital and prison characteristics was established in 1950 for male tuberculous recalcitrants. First located in temporary quarters at Terminal Island near Los Angeles, the unit was moved in 1954 to the newly constructed California Medical Facility near Vacaville in northern California. Meanwhile, as use of the facility increased, the number of beds available was increased to 50, with an average occupancy of 40.

The California Medical Facility was established to care for male felons from the State prisons who require special treatment for physical or psychological illnesses, including tuberculosis (3). The tuberculous felons and recalcitrant tuberculous patients sentenced by the courts for the specific misdemeanor of violation of isolation are cared for in the same section of the hospital. Medical and nursing services are provided by the institution staff. Individual and group psychotherapy, as well as occupational and recreational therapy, are available on a voluntary basis when permitted by the clinical status of the patient.

Although the local health officers now have a legal weapon of great utility, the law has been used conservatively. Annually, only about 1 in

Dr. Kupka is chief, and Mrs. Gibson, the nursing consultant of the bureau of tuberculosis control, California State Department of Public Health, Berkeley.

500 patients under health department supervision has been sentenced to the facility. Education and persuasion are tried repeatedly before the health officer turns to legal procedures. Court action is almost always against an offender who has repeatedly disregarded the most elementary protective practices and violated isolation orders. Local judges have seldom failed to act upon the health department's complaint in such a situation. If the trial does not result in incarceration, the court at least puts the offender on probation, on condition that he return to the sanatorium and remain there until dismissed medically.

The California State Department of Public Health screens admissions to the medical facility, assists in establishing general treatment policies of the tuberculosis section, and sometimes participates in the legal processes. At first the screening was necessary to keep the number admitted within the unit's capacity, but it also has enabled the department to request reconsideration of an occasional commitment when the evidence of contagiousness was out of date or not convincing. In earlier years it gave the department an opportunity to discuss the legal action with the local judge, sometimes voiding an improper commitment.

Between December 1950 and December 31, 1956, 211 recalcitrant tuberculous patients were admitted to the California Medical Facility. What happened to these men? How many have been lost to observation? How many are still alive? Over several years, has the disease of most of them improved? Are they currently under supervision or care? Have their attitudes changed?

Since the State bureau of tuberculosis control keeps only an admission and discharge file, limited to basic identifying, medical, and legal data, followup information was obtained from questionnaires sent to the 37 local health jurisdictions from which one or more persons had been sent to the facility for recalcitrants. Name, age at admission, facility file number, dates of admission and discharge, and length of sentence of each of the patients were abstracted from the basic file and typed on a questionnaire before it was sent to the appropriate health department. The local health departments were asked to add from their records of the patients

the last-known status of disease, interval since last examination, type of present medical supervision, admissions to other tuberculosis hospitals since discharge from the facility, marital status at time of first admission, and attitude since discharge.

Twenty-eight of the 211 patients were in the California Medical Facility on December 31, 1956, and were not included in the study. A total of 183 questionnaires were sent, and all but 2 were completed and returned. This excellent response may be interpreted as reflecting the strong interest of the local health departments in the legal detention program.

The responses indicated that 22 of the 181 were known to be dead; 6 died while in the facility; 16, after discharge. The remaining 159 patients constitute the group analyzed in tables 1-4.

About three-quarters (131) of the patients were in the age group 25-50 years. In this sample few young adults and oldsters were recalcitrants. The age of patients at first admission to the facility was as follows:

Age group (years)	Number
Under 20	4
20-24	6
25-29	26
30-34	27
35-39	21
40-44	25
45-49	32
50-54	15
55-59	10
60-64	5
65 and over	8
Not stated	2
Total	181

Negroes and Mexican-Americans each comprised 13 percent of the group; there were no Chinese or Japanese.

Ethnic group	Number	Percent
White	125	70
Negro	25	13
Mexican-American	24	13
Indian	3	4
Filipino	1	
Not stated	3	
Total	181	100

The marital status of the group at time of admission was in marked contrast to that of the male adult population in general. At the time of first admission, only 42, or 23.2 percent, were married and 89, or 49.2 percent, were single, separated, or divorced. The status of 50, or 27.6 percent, was not known or not stated.

As expected, the most populous jurisdictions in the State sent the most patients to the facility. However, 37 of the 47 full-time health jurisdictions in California have sent a patient to the facility on at least one occasion. Such wide acceptance reflects the need for this kind of institutionalization and also the willingness of the local health officers to utilize this legal resource after other means of achieving control of the infectious person have proved futile. Since Los Angeles County operates an excellent comparable sheriff's facility at Mira Loma, the health departments in that county have usually sent only recidivists or individuals with significant prison records to the State facility.

The following observations concern only the 159 patients who were known or presumed to be living at the time the data were gathered.

Table 1 indicates the strong possibility of satisfactory outcome of the disease even in tuberculous patients of the type covered by this report; the disease status of 91, or 57 percent, was known to be inactive or probably inactive.

After discharge from the facility, some of the

individuals were lost to observation. Since the status of 13 of the active and probably active group had not been checked for a year or more and 11 had dropped out of sight so that no data were available, it is clear, but not surprising, that the patients in the group continue to present caseholding problems (table 1).

Table 2. Attitude after discharge of recalcitrant tuberculous patients, California, 1950-56

Patient's attitude	Last-known status of disease					
	Total	Active	Probably active	Inactive	Probably inactive	No data
Total.....	159	53	4	85	6	11
Improved.....	38	12	1	23	1	1
Unimproved:						
Same.....	85	37	2	41	3	2
Worse.....	2	1	0	1	0	0
Unknown.....	34	3	1	20	2	8

Attitudes of the patients toward their disease, judged in the broadest terms and, of course, highly subjectively, are shown in table 2. When these data are compared with those in table 1, it is evident that improvement in the status of the patient's disease had occurred in many cases without a corresponding change in the patient's attitude. Thus, although 72 percent of the patients had been examined within 12 months (table 3), only 24 percent were reported as having an improved attitude toward the care of their disease.

The majority of the surviving group were not living with family, and many of them continued to lead a nomadic existence. From information volunteered on the questionnaires, it was evident that many of them were alcoholics. In members of such a group a change in attitude in the direction of cooperation with a public agency is perhaps not to be expected. Nevertheless, for these patients legal isolation accomplished at least two important and previously unattainable objectives. First, it reduced the length of time the patients could spread tuberculosis to others, and second, the medical and surgical therapy given the patients led to eventual arrestment of disease in a considerable number.

Table 1. Last-known status of disease of recalcitrant tuberculous patients,¹ California, 1950-56

Last-known status of disease	Length of time prior to Dec. 31, 1956, that status was known.			
	Total	0-6 mos.	6-12 mos.	More than 12 mos.
Total.....	159	94	25	40
Active.....	53	33	8	12
Probably active.....	4	3	0	1
Inactive.....	85	48	16	21
Probably inactive.....	6	4	1	1
No data.....	11	6	0	5

¹ Known or assumed to be living on Dec. 31, 1956.

Table 3. Length of time since last examination of recalcitrant tuberculous patients, California, 1950-56

Last known status of disease	Total	0-6 mos.	6-12 mos.	More than 12 mos.	Time not stated
Total: Number-----	159	99	15	31	14
Percent-----	100	63	9	19	9
Active-----	53	33	5	9	6
Probably active-----	4	3	0	1	0
Inactive-----	85	55	10	16	4
Probably inactive-----	6	4	0	1	1
Activity undetermined or not stated-----	11	4	0	4	3

Patients discharged from the recalcitrant unit are routinely transported to their own health jurisdictions by the sheriff's department of that county. The discharge occurs on the last day of the sentence, that is, 6 or 12 months after admission, depending on whether the patient is serving a first or subsequent sentence. If further treatment is needed, and it often is, the patients are immediately admitted to a tuberculosis hospital, usually the one operated by the home county.

Table 4 shows 245 later admissions to any tuberculosis institution for the group. Ex-

Table 4. Admissions¹ to tuberculosis hospitals after discharge from California Medical Facility among 159 recalcitrant tuberculous patients, California, 1950-56

Type of hospital	Number of admissions	Subsequent departures AMA ² or AWOL	
		Number	Percent
Total admissions--	245	92	38
County tuberculosis facilities-----	164	64	39
VA tuberculosis hospitals-----	39	23	59
Private hospitals-----	11	5	45
State mental institutions-----	8	0	-----
California Medical Facility (resentenced)-----	23	0	-----

¹ Includes readmissions.

² Against medical advice.

cluding 23 readmissions to the recalcitrant facility, which is escapeproof, the remaining 222 admissions eventuated in 92, or 41 percent, subsequent unauthorized departures, a further verification of the failure to change attitudes. Of the 23 readmissions to the California Medical Facility, 4 were accounted for by 2 patients, who each had been sentenced to 3 separate terms in the prison ward.

This is to be considered as a progress report and from it no solid evaluation of the impact of this type of program upon the control of tuberculosis can be made. It would be useful to compare a group of recalcitrants who were not incarcerated and to note any differences in the behavior of their disease. Even more valuable would be a comparison between the number of new secondary cases attributable to contact with members of a nonincarcerated group and the secondary cases attributable to a group such as the one described in this paper. However, the excessive mobility, evasiveness, and social instability of the patients make such long-term studies extremely difficult.

Summary

Sentencing recalcitrant tuberculous patients to a special State facility by court action has proved practicable and useful in California. Use of this legal procedure not only has decreased the hazard of transmission of disease but also has created an opportunity for the commencement or continuation of much needed treatment for the patients.

Although the attitude of the majority of patients did not improve as a result of their incarceration, most of them remained under some type of medical supervision following discharge, and three-quarters had been examined during the 12 months preceding receipt of the questionnaire sent to the local health departments. However, many evaded regular medical supervision, especially after 1 year; one out of eight patients had to be readmitted to the State facility; and a third of those subsequently admitted to local tuberculosis hospitals again resorted to unapproved self-discharge. Nevertheless, the data indicate that by the time of the study more than half of the patients had

reached the classification of inactive or probably inactive.

The majority of health jurisdictions in the State have sent at least 1 patient to the facility, which would indicate that it is meeting a real need, but the small total (211 in 6 years) indicates that it is not being used indiscriminately or excessively.

films

Recognition of Leprosy

16-mm. motion picture, color, sound, 13 minutes, 1959, not cleared for television. (Order No. M-374.)

Audience: Practicing physicians and medical students.

The clinical manifestations of leprosy are depicted as they appear in patients of the Public Health Service Hospital at Carville, La. Techniques of taking and staining skin scrapings to demonstrate the etiological agent, *Mycobacterium leprae*, and of taking skin biopsies to demonstrate pathology of peripheral nerves are shown. Diagnostic procedures are included.

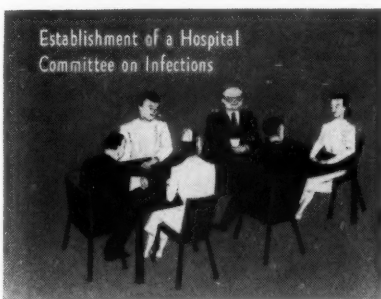


The film is not for sale. It is available on short-term loan (United States only) from the Communicable Disease Center, Public Health Service, Post Office Box 185, Chamblee, Ga.

Staphylococcal Disease: Manifestations, Prevention, and Control

35-mm. filmstrip, color, silent, 36 frames, cleared for television, 1959 (Order No. F-343).

Audience: Doctors, nurses, hospital personnel.



Various clinical manifestations of hospital-acquired staphylococcal disease, how it is spread, and some of the techniques and methods useful in the control of infections are depicted in stylized drawings.

Included with each filmstrip is a "kit" which contains an instructor's guide, bibliographies, hospital checklist, suggestions and a sample form for telephone surveys, and pertinent reprints. The requestor may keep the kit, whether the filmstrip is borrowed or purchased.

For short-term loan, in the United States only, the filmstrip is available from the Communicable Disease Center, Public Health Service, Post Office Box 185, Chamblee, Ga.

It can be purchased at approximately \$5.10 f.o.b. New York (10

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- (1) Telford, P. K., and Bogen, E.: Compulsory isolation for tuberculosis. *Am. Rev. Tuberc.* 45: 288-291 (1942).
- (2) Kupka, E., and King, M. R.: Enforced legal isolation of tuberculous patients. *Pub. Health Rep.* 69: 351-359, April 1954.
- (3) McGee, R. A.: California builds a new prison system. *State Government* 25: 143-146, July 1952.

percent discount for nonprofit organizations) from United World Films, Inc., 1445 Park Ave., New York 29, N.Y.

Aseptic Technique—Handwashing

16-mm. motion picture, color, sound, 3½ minutes, cleared for television, 1959 (Order No. M-375).

Audience: Nurses, student nurses, medical students, physicians.

This film shows a method of handwashing, using cake or liquid soap, that may be used in the hospital and modified for use in the public health field.

It is available, in the United States only, on short-term loan from the Communicable Disease Center, Public Health Service, Post Office Box 185, Chamblee, Ga.

Prints can be purchased, at approximately \$28 f.o.b. New York (10 percent discount for nonprofit organizations), from United World Films, Inc., 1445 Park Ave., New York 29, N.Y.



Epidemic Crisis in East Pakistan

April-July, 1958

THOMAS A. COCKBURN, M.D.



A crowd of 2,000 women and children saw a health show in a village near Comilla, East Pakistan. Health shows were used to further a mass vaccination campaign during the 1958 smallpox epidemic. About 30 million Pakistanis were inoculated.

EPIDEMICS of smallpox and cholera began in October 1957 in the Eastern Province of Pakistan, and by April 1958 about 1,500 people were dying each week. The Province's public health services, desperately short of money, staff, and equipment, were hard pressed. In the first 6 months of 1958, the smallpox cases reported were 44,736 and deaths, 20,444. The cholera cases reported were 10,438 and deaths, 6,684.

On April 9 the Chief Minister delegated responsibility for all matters pertaining to the epidemic to a citizens committee of 60 persons, while everywhere volunteers began a vast, spontaneous, uncoordinated vaccination effort. Twenty-one nations, the World Health Organization, and several voluntary agencies sent East Pakistan a total of 8,243,000 cc. of dry vaccine and 18,284,025 cc. of lymph vaccine for smallpox, and 2,475,600 cc. of vaccine for cholera. Five international teams came to give epidemiological assistance.

Ten days after an appeal for help, the first shipment of smallpox vaccine arrived from the United States. By the middle of May, 40 percent of the 46 million population of East Pakistan had been vaccinated, which meant a vaccination rate of more than 1 million per week, and the supply of vaccine was satisfactory. In June, 2 million people a week were inoculated; the number of new cases dropped to 300 a week from a peak of 3,000 a week in May; and a practical means of eliminating the disease in East Pakistan was being developed. Late in June the monsoon began. By July cholera had disappeared, smallpox became less severe, vaccinating had almost ceased (figs. 1 and 2), and by the end of the month the international teams had left the Province.

About 30 million people were vaccinated in the first 6 months of 1958, a substantial achievement in any country, but under the conditions prevailing in East Pakistan, it was remarkable.

The Setting

The 46 million people of East Pakistan live on the delta of the Ganges and Brahmaputra Rivers. Most of them are Moslems, and many of the women are still kept in purdah.

The Province is almost entirely agricultural. Dacca, the capital, with 600,000 people, and Chittagong, with 300,000, are the only sizable cities. The land consists of silt deposited by the rivers, and when the monsoon breaks in June much of the land, only a few feet above river level in the dry season, disappears under water. The Province is crisscrossed by waterways, varying from a few yards to more than a mile in width, and outside the towns and villages, boats are the easiest and most common means of travel.

Since there are no stones in the alluvial soil, buildings and roads are made of bricks. Every village, hamlet, or row of houses has one or more water tanks, formed where clay has been removed to make bricks or to raise the land to a level above the flood waters. These water tanks are the center of village life, where people come to bathe, wash clothes, urinate, defecate, and collect water for cooking and drinking.

Public Health Service

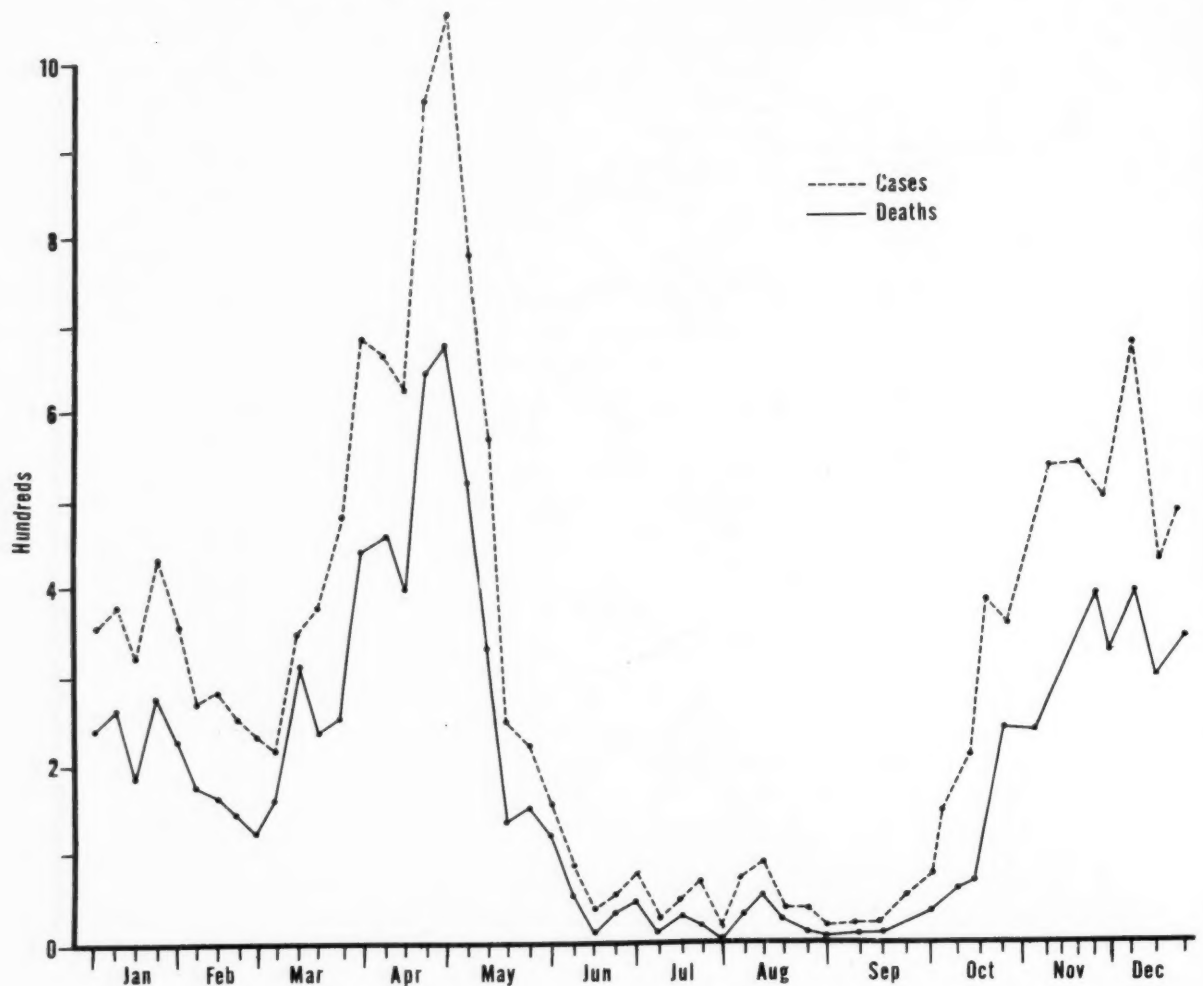
East Pakistan had departments of medical care, public health engineering, and public health which were responsible to the Minister of Health through the Secretary.

The Department of Public Health which faced the smallpox and cholera epidemics was small. It consisted of a director, 4 assistant directors, 5 district health officers, 12 doctors working on a BCG program financed by UNICEF, 3 doctors helping a village aid project, a small malaria unit, and vaccine laboratories. The department's budget in 1958 was 5 million rupees (\$1 million).

The administration of public health was decentralized so that local authorities based in the Province's 17 districts and in the municipalities employed their own staffs with financial assistance from the department. Only 5 dis-

Dr. Cockburn of the International Cooperation Administration serves as provincial public health adviser of the Government of East Pakistan. He is former deputy chairman of the East Pakistan Epidemic Control Committee and director of the Institute of Public Health in Dacca.

Figure 1. Cholera cases and deaths, East Pakistan, 1958



district health officers were directly responsible to the director of public health; the other 12 were controlled indirectly through financial assistance.

Each district of 800,000 to 5 million people is divided into 1 to 5 subdivisions, which are in turn divided into police areas, or thanas, governed by union boards. The boards pay chowkidars, the village police, who also report births, deaths, and notifiable diseases when they visit the police stations twice a week.

The thanas also have trained sanitary inspectors who train their own small staffs of health assistants and vaccinators. They are responsible to the district health officer, and, in theory, carry out all health duties. East Pakistan has about 400 sanitary inspectors, 1 per 100,000 population. Few diagnoses of infec-

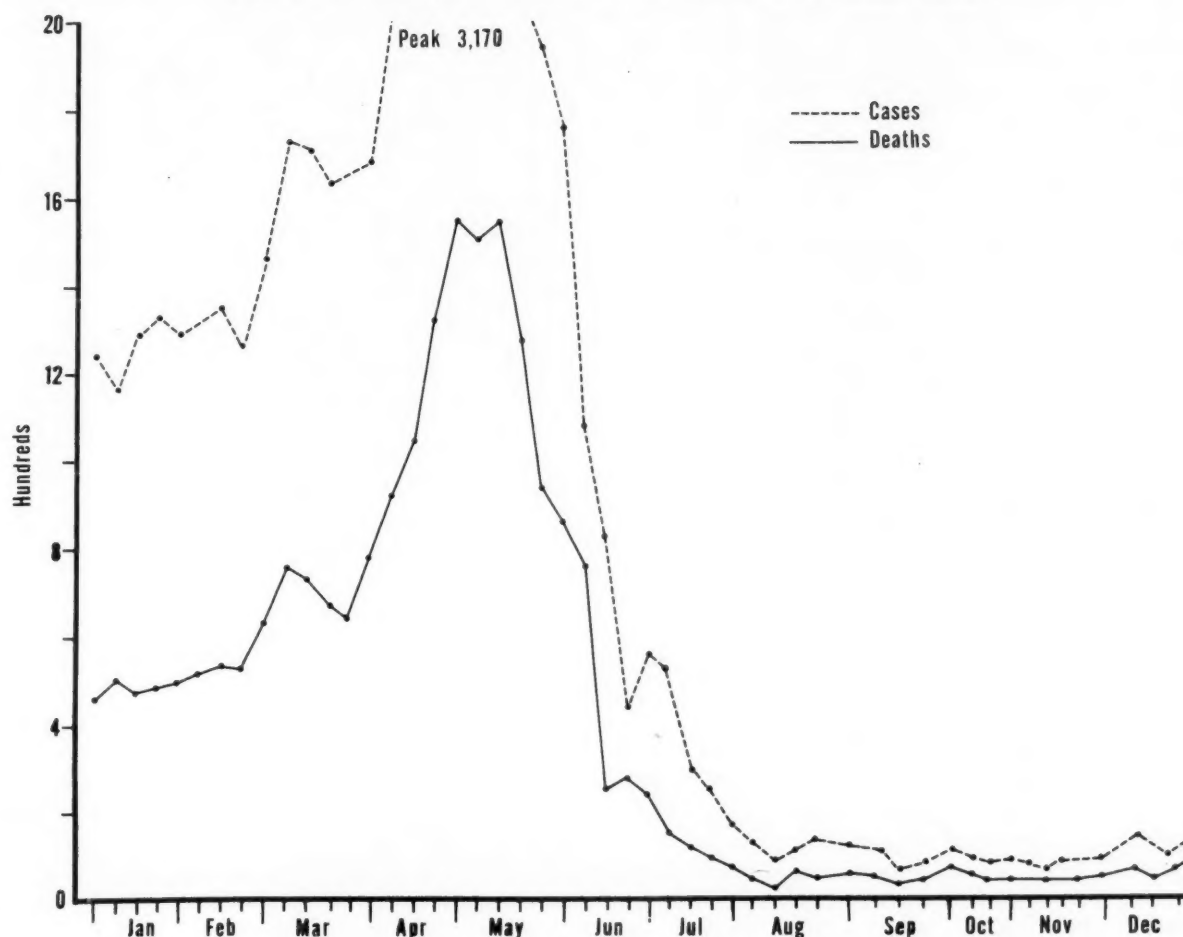
tious diseases or causes of death are made by qualified medical practitioners.

International Teams

The International Cooperation Administration and U.S. Information Service teams already in Pakistan dropped other duties to combat the epidemics. The ICA teams, six men from U.S. Operations Mission, West Pakistan, and six from U.S. Operations Mission, East Pakistan, concentrated on organizing and operating antiepidemic activities. The five-member USIS team took over health information tasks with the collaboration of the ICA health educator.

The international teams sent to the Province performed a variety of jobs. The nine

Figure 2. Smallpox cases and deaths, East Pakistan, 1958



officers from the Communicable Disease Center, Public Health Service, trained all the public health physicians in East Pakistan in antiepidemic measures, tested the potency of vaccines, investigated outbreaks of cholera, did epidemic surveillance early in the vaccination campaigns, and later evaluated the success of the vaccinating.

The nine-man U.S. Navy medical research team from Formosa set up a laboratory in the Institute of Public Health for the diagnosis of cholera and conducted bacteriological surveys in affected villages. They also evaluated the potency of the vaccines being received and worked on the production of smallpox vaccine in eggs, the production of dry vaccine, and improved methods of vaccine production from cows.

The six members of the team from the U.S.S.R. collaborated in the studies of cholera,

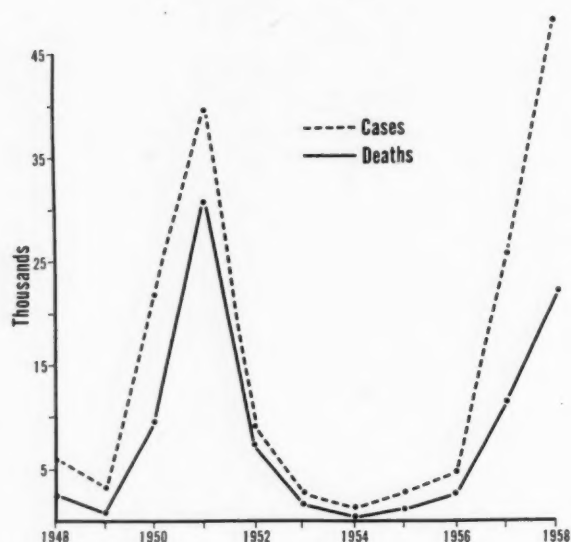
advised the Department of Public Health on smallpox, and were interested in testing the value of bacteriophage in the treatment and prevention of cholera.

The 20-member team from Afghanistan performed vaccinations in the Dacca, Chittagong, and Chandpur areas.

Smallpox in the Eastern Province

Epidemics of smallpox have occurred at intervals of a few years in East Pakistan (fig. 3). The epidemics are highly seasonal. Each year the Department of Public Health has made and distributed vaccine and has vaccinated on a large scale. The 5 to 16 million vaccinations reported per year from 1948 to 1957 would indicate that the population had a high degree of immunity. In spite of these reports, a major epidemic occurred.

Figure 3. Smallpox cases and deaths, East Pakistan, 1948-58



The vaccine routinely used was made by the vaccine laboratory in the Institute of Public Health and distributed in small cylindrical bottles stoppered with a cork. The vaccinator "wetted" the cork with vaccine, dabbed the arm, and made a circular scratch with a lancet sterilized in flame kindled by igniting cotton wool dipped in methylated spirits. For a primary vaccination this was done in two places on each arm. The vaccine was said to be potent for 7 to 10 days without refrigeration.

In a small way I checked on this procedure in two suburbs of Dacca, where people had been vaccinated 3 to 7 days before with vaccine kept for a week without refrigeration. Among 129 people, I saw only 2 whose vaccinations were not effective. Both were adults who had been previously vaccinated.

The CDC and the U.S. Navy teams recorded their evaluations of the situation in a series of reports which provide much of the data cited in this paper. In May, the CDC epidemiologists, each paired with a Pakistani doctor who acted as guide and interpreter, visited the various districts to inquire into the morbidity situation and to check the vaccination status. Vaccination rates were estimated by inspecting the scars on samples of the populations. The data had to be collected in great haste and for this reason are not suitable for analysis in great

detail, but nonetheless probably give a fair indication of the true situation. Seventeen percent of the sample group were found never to have been vaccinated, 22 percent to have old scars only, 41 percent to have been revaccinated in 1958, and 20 percent to have had primary takes in 1958. In a population of 46 million, this represents a substantial number of vaccinations.

Generally, the epidemiologists of the team felt that the statistics available on morbidity gave a true picture of the trends, even if the totals were not strictly accurate. They analyzed the number of deaths reported, since this figure was more likely to be accurate than the number of cases reported.

Briefly, they found that most of the deaths were in children under 10 years of age. They also discovered that chances of acquiring smallpox were related to vaccination history. Of 685 patients they studied, 19 had been vaccinated within the past 10 years, 207 had been protected for more than 10 years, and 459 had never been vaccinated.

The geographic distribution of cases was not uniform. The northeastern districts almost escaped the epidemic, the east central ones suffered heavily in 1957, and the western ones had the peak of their epidemic in 1958. In the Rajshahi and Dinajpur Districts, the CDC officers traced the spread of the infection along the railroad.

Vaccinating During the Crisis

After the Chief Minister handed over epidemic control to the citizens committee, local nonmedical groups in every district took over the vaccinating. The medical colleges in Dacca were closed, and doctors and students spread out over the entire Province as volunteer vaccinators. They worked for 2 or 3 months, received only a bare subsistence allowance, and undoubtedly vaccinated many people, 300,000 in Dacca alone.

But their efforts were uncoordinated, and 200 or 300 ardent workers, even with the assistance of official vaccinators and 400 sanitary inspectors, could not protect 46 million people. The average vaccinator, working from house to house and stopping to persuade reluctant people, cannot average more than 100 inoculations



At a roadblock in Comilla all passers-by are vaccinated against smallpox.

a day. Travel on foot between villages and 1- to 3-day trips to and from Dacca lower the daily average substantially.

After 3 weeks of consideration, the Government and the epidemic control committee finally agreed on the following course of action: vaccinate 80 percent of the people within 6 months, stamp out the remaining traces of infection in the next 6 months, enforce the law requiring children to be vaccinated, and attempt to revaccinate the population every few years through an improved health service. The Government also agreed that during the initial phase, 1 volunteer per 1,000 people would be raised and trained through the local committees and that the Department of Public Health would be strengthened in time to undertake the second and succeeding phases.

The Government appealed for these local volunteers, 1 for each 1,000 persons, a total of 45,000. The task was great, but the scheme had the advantage that the people of each village or group of hamlets could be vaccinated by someone who knew them. Traveling expenses for such volunteers would be minimal and much of the resistance, especially from women in purdah, would be overcome. Doctors, students, and sanitary inspectors could instruct the volunteers instead of doing the vaccinating themselves.

By this time in May, more than 3,000 cases

and 1,300 deaths from smallpox and 600 deaths from cholera were reported every week. Already nearly 20 million persons had been vaccinated, and more than a million more were being vaccinated every week, but still this task was not being done quickly enough, and coverage was not sufficient. Therefore, a joint Pakistan-ICA-USIS team planned an additional campaign to cover the Province, district by district, over a 6-month period.

The team began work in the Tippera District. In the subdivision of Comilla they used a bagpipe band from the Frontier Force to attract crowds to the stadium for health shows. Crowds of thousands attended two evening mass demonstrations and a number of enthusiastic youths volunteered to be trained as vaccinators. But the volunteers were of little use; a hundred turned up the first day to do the vaccinating, a handful the next day, and only one on the third day.

Although the operation was a failure in the number of vaccinations performed, the team found out which types of health information campaigns were practical, the willingness of the people to collaborate, the difficulties of travel, the local resources, and the most feasible ways of distributing vaccine and training volunteers.

In subsequent programs, audiences, mostly all male, at the night health shows ranged from 2,000 to 10,000. In Dinajpur the women were persuaded to attend by dividing the field in two with a bamboo fence to separate the sexes.

The teams spent daylight hours meeting with committees, giving speeches over a loudspeaker mounted on a car, and distributing pamphlets. Frequently, as the teams drove along a lonely road bordered by fields of jute or rice stretching for miles, they stopped the cars and blew the horns. At the sound, figures wearing enormous sun hats popped out of the fields of rice or jute and a few started to run toward the car. In 5 minutes a fair-sized crowd assembled to hear a talk on smallpox and vaccination.

Brahmanbaria, another subdivision of Tippera, with a population of 1 million, provided a heartening contrast to the experience in Comilla. The Pakistan-ICA-USIS team could spend only a day there consulting with the subdivisional officer and the subdivisional health officer, a sanitary inspector. These two men

had only a jeep, very little money, and a handful of sanitary inspectors and vaccinators to cover a large territory with few roads. However, they looked for volunteers who were disciplined, intelligent, educated, and available in large numbers. They found them in the school children.

The children easily picked up the vaccination technique from their teachers, who were trained by the sanitary inspectors. The teams of children, supervised by their teachers, worked in the villages around their schools. They did not need transportation and were welcomed by everyone, including women in purdah. When the CDC team made its evaluation a month later, they found that more than 80 percent of the population sampled had been vaccinated.

The successful campaign in Brahmanbaria demonstrated that mass vaccination is not basically a medical undertaking but a layman's job of organization, propaganda, and logistics. In subsequent months this was proved over and over; wherever the administrative officers took personal charge, the vaccinating was effective, but where they were uninterested, the campaigns were failures.

The Vaccine

Most of the vaccine sent to East Pakistan was the lymph type, requiring refrigeration. The Government of East Pakistan requisitioned the only cold-storage facility in Dacca to store it as it arrived by air. Batches packed in dry ice often arrived with the dry ice surviving and, whenever possible, were forwarded with the packing undisturbed to field stations. Some dry ice was still unevaporated when packages reached places a day's journey from Dacca.

According to the manufacturers, the vaccine would remain potent 2 to 3 days without refrigeration, but in our experience, most of it involuntary, the vaccine was effective for a week or more in temperatures of 80°-100° F. The packaging of the vaccine from the United States was bulky; 50,000 doses occupied the same space as a million doses of the local product, and this was a big handicap, for refrigerators were very scarce.

In addition to the vaccine sent to Pakistan,

the vaccine laboratory of the Institute of Public Health obtained an adequate supply of calves and, by May, was turning out 1 million doses a week. A laboratory in Lahore, West Pakistan, supplied 500,000 doses weekly. The U.S.S.R. team suggested two Soviet dry vaccine plants were available should the Pakistan Government wish to accept them. The Navy team made a dry vaccine from a chick embryo growth with an apparatus used by the Department of Agriculture to prepare rinderpest vaccine. The United States, through ICA, offered a dry vaccine plant capable of processing 500,000 doses a week, and the Pakistan Government accepted it.

Dry vaccine remains potent without refrigeration much longer than the wet type, and its advantages where travel is difficult and refrigerators are scarce are obvious.

Vaccination stylets were in short supply, so at first the needles which came with the vaccine from the United States were used with vaccine from other countries. Then the United States team suggested using a large steel sewing needle which would be given to the person who was vaccinated with it. The needles are valued by the people in Pakistan, and their use eliminated channels of cross-infection and the nuisance of sterilizing instruments. In June ICA sent 11 million sewing needles.

The technique of vaccination was streamlined. We stopped swabbing the arm before inoculation because of the shortage of cotton wool and alcohol and no cross-infections were reported. The bandage at the inoculation site was also eliminated. With wet vaccine, the bottle was given a shake and the dampened cork applied to the arm. The dry vaccine bottles lacked stoppers, so the needle was dipped in the bottle and a drop taken out.

The method taught was the multiple pressure technique of vaccinating, but some vaccinators made punctures, some, long scratches, some, elaborate crosshatchings, and some did as they were taught. All methods seemed to work if the vaccine was fresh and potent. In the campaign we accepted no contraindications to vaccination, for the risk of infection was too great.

The diversified sources of the vaccine gave us a chance to compare the potency and various

fashions of packaging. The Navy team has reported on comparisons of potency.

For vaccine to be used under conditions similar to those in East Pakistan, the following requirements are recommended for convenience in handling. The vaccine should be dry. Each ampoule or bottle of vaccine should contain about 1 day's supply, approximately 100 doses. The bottle should be sturdy, flat bottomed so that it can stand alone, and have a mouth wide enough to make the transfer of the diluent easy.

The diluent containers should not be stoppered with corks or screw tops which leak during shipment by air. A minimum of glass-cutting should be required to open them. The device holding the stopper in place should be simple to remove. The fluid should be transferable without syringes or pipettes.

Bottles for the reconstituted vaccine should have stoppers which can be used as applicators. Special applicators are easily lost. Some substance should be added to prevent growth of contaminating bacteria.

The instructions and the expiration date with the name of the month, rather than the number, should be written in a language familiar to the person using the vaccine. The expiration date should be on each bottle. The package containing the bottles should be strong, easy to open, and include all essential items so that it is ready for distribution.

The Cholera Epidemic

In East Pakistan cholera appears in dry weather, reaches a peak in May, and disappears with the first rains. The Province normally has several hundred deaths from cholera each week in May (figs. 1 and 4).

The vaccine in present use requires two injections of 0.5 ml. and protects only for 6 months, but in India, it is customary to give one dose of 1.0 ml. Semiyearly immunizations were simply not practical in East Pakistan.

Although many inoculations were given, the Department of Public Health concentrated on distributing drugs to treat cholera. However, medical staffs are spread very thinly over the Province and transportation for them or for patients is scarce. A trip to a hospital might

mean carrying a patient many miles by bullock cart over the rice paddies, so that the chances of a patient being seen by a medical person were very small. In the middle of the outbreak, a visit was paid to the cholera ward in Barisal, which was found empty, although stricken villages were reported from all sections of the surrounding district.

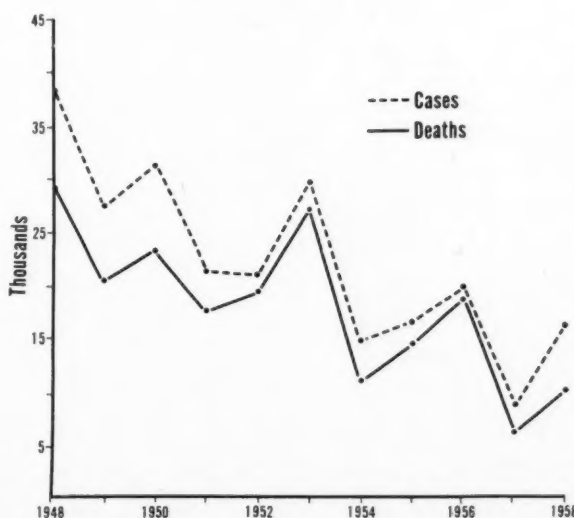
The Department of Public Health sent mobile teams to affected villages, but since reporting of the outbreaks took several days, the patients were either dead or convalescent by the time the teams reached them. Often, many people in a village became ill at once; a week or 10 days later another village some distance away would be stricken.

Cholera reporting since 1948 appears to be inadequate; cases about equaled deaths, although in 1958 the fatality rate was 40 percent.

Diagnosis can be difficult and in 1958, physicians called almost every case of diarrhea a case of cholera. The U.S.S.R. and Navy teams studied cases in hospitals and concluded that perhaps 50 percent of the cases in the cholera wards were due to other infections.

Both teams had difficulty finding fresh cases; patients admitted to the hospitals were convalescent and had already been treated in a variety of ways. The Navy team isolated *Vibrio cholerae* from nine patients in a cholera ward and five apparently healthy contacts in a Dacca

Figure 4. Cholera cases and deaths, East Pakistan, 1948-58



suburb. The isolates had these characteristics in common: they fermented sucrose and mannose but not arabinose, were positive in the cholera red test and negative in the Voges-Proskauer and hemolysis tests, and serologically were of the Ogawa type.

Preventive measures against cholera in other countries depend on safe water, good hygiene, and efficient sewage disposal. The Pakistan Government, with ICA help, is trying to provide piped water in the larger towns, large-bore tube wells in the smaller ones, and smaller tube wells for the villages. However, it may be 10 years before the general population has wells and the average villager is persuaded to abandon his tank for washing and drinking water.

Epidemiology of Cholera

Bengal has the unenviable distinction of being the home of cholera and quite possibly is the only place on earth where the infection can exist all year round decade after decade. Cholera is endemic only in Asia. The U.S.S.R. team, which had been operating in China, stated that all the epidemics in the U.S.S.R. and China were imported from outside those countries. In the Indian subcontinent, the disease is found all year round only in Bengal.

Cholera first appeared on record in severe epidemic form in 1817 in the Calcutta area. Four times in the 19th century it appeared in a series of waves around the world, and these major pandemics were traced back to Bengal. There are possibly smaller foci elsewhere in southeast Asia, but the Bengal area, which the 1947 partition divided between India and Pakistan, is the only major endemic focus. If cholera could be eliminated there, it seems likely that it would disappear entirely from the world. However, the epidemiology of the disease has not been worked out completely, although obviously it is associated with unhygienic conditions.

Why is cholera endemic in so limited an area? A possible answer lies in the nature of the country—the flat, waterlogged land, the dry season and the monsoon season, and the water tanks which are centers of community life. The paths of spread of the cholera pathogen in an average Bengal village are numerous, but all

are insignificant compared with the massive potentialities of these tanks.

The distribution of cholera in East Pakistan supports the theory that the tanks are related to the maintenance of the infection. In the northern districts and the higher areas where tanks are not so common, cholera apparently occurs only during the epidemic dry season. In the low southern districts, where tanks surround every hamlet, the disease persists year round.

Traditionally, cholera disappears in Bengal with the onset of the monsoon. During the 1958 monsoon season outbreaks of cholera reported in Noakhali and Faridpur, upon investigation, seemed to be genuine, indicating the infection to be endemic there in spite of the monsoon. With the appearance of the dry weather in October 1958, the cholera soon shot up alarmingly to a maximum of 700 cases a week, but the rains in January 1959 were heavier than usual, and almost immediately the cholera dwindled. In February 1959 a local epidemic in Comilla occurred, but following some unseasonable rains, the disease again disappeared. In March the whole area had heavy rainfall and the cholera sank to an extremely low level for this time of year.

V. cholerae, recently isolated, can grow in a decidedly alkaline media. It is difficult to concede that this unusual cultural requirement is purely nonadaptive, so it is natural to look for some environment where the pressures of natural selection result in the production of such a characteristic.

One can speculate on these facts. If the tanks are the basic reason the infection is localized to Bengal, the disease spreading from there to other parts of the world, then possibly changes in the alkalinity of the water in the tanks might account for epidemiological differences between the dry and wet seasons as well as the requirements of the organism. Perhaps the first rains stop the main avenue of transmission by altering the pH of the water in the tanks.

Studies are in progress to see if there is a positive correlation between the pH of the tank water in different periods of the year and the incidence of cholera. Preliminary studies in the dry season have already shown that tank



A physician from the Communicable Disease Center and his companion, a Pakistani physician, prepare to give inoculations against cholera.

water commonly has a pH much in excess of 8, which would favor the cholera organisms. Following a few days of dry weather, the pH before dawn is between 7.0 and 7.5 and by evening can be as high as 9.5 or 10.0. It is known that pH in such waters is largely dependent on the activity of algae that produce either oxygen or carbon dioxide according to the degree of light available, and that considerable changes take place between night and day. The rainfalls theoretically could reduce the pH both by the clouds reducing the sunlight and, even more, by dilution or making the water muddy. During the dry season, all ponds become almost saturated with algae. On rainy days, the pH does not commonly rise above 8.4, the optimum for *V. cholerae*. If it should be proved that the pH is altered markedly by the monsoon or heavy rains, a reasonable explanation can be given for the known facts of the epidemiology of the infection as well as the cultural requirement of the organism.

Whether cholera has long-term carriers is not yet clear. The Soviet team said they had found

people excreting organisms for 2 months and in one instance for 1½ years. However, it is difficult to test the pathogenicity of organisms recovered from carriers. It would not be necessary for carriers to excrete organisms for more than 3 months for the organism to survive permanently in south Bengal.

At present, hope of controlling and eradicating cholera depends on providing safe drinking water and convincing people of the importance of hygienic measures. Immunization is a weak barrier and the value of bacteriophage remains unproved. In East Pakistan the trend of the disease is downward (fig. 4), which gives hope that environmental changes might be leading to its extinction.

Epidemiology of Smallpox

Smallpox in southeast Asia was clearly described by Chinese writers 4,000 years ago, and, according to 3,000-year-old scripts such as the Susruta, Indian Ayurvedic physicians were also familiar with it.

The history of smallpox in East Pakistan is marked by substantial epidemics which last for about 3 years, recurrence at intervals of 5 or 6 years, and seasonality. Substantial 3-year epidemics occurred in the early 1940's, the beginning of the 1950's, and in 1957-58. Smallpox is a disease of the early months of the year. Its Bengali name, *basanta*, means "the spring-time."

The apparent explanation of the recurring epidemics is that smallpox is following the same cyclic type of pattern as measles in the Western countries. An epidemic leaves few susceptibles so that another cannot occur until a fresh crop of susceptibles appears. This concept is supported by the fact that most deaths are among children under 10 years of age, and 40 percent of the mortality is among those under 5 years.

But the matter is not so simple. Even in the worst epidemics in East Pakistan, the total number of cases is under 100,000 a year, while the babies born each year are counted in millions. For the infection to immunize enough people during an epidemic to produce a cyclic pattern, a considerable number of inapparent

infections would have to be postulated for each case of smallpox.

This happens in many other infections but, as far as I know, it has not been demonstrated in smallpox. However, the fluctuations in the immunity status of the population necessary for cyclic epidemics are probably provided by other factors, the vaccinator and his vaccine.

Each year millions of vaccinations are performed by the public health services, but the number depends on the epidemic conditions of that particular year. Ten million persons may be protected if there is an epidemic scare but only 2 or 3 million in nonepidemic years. Immunity given by vaccination in step with the epidemics may produce the cycles that are so prominent in East Pakistan.

Smallpox is easy to prevent; vaccination is simple and can be done by illiterate people. The vaccine is cheap and can be mass-produced. It should be possible for each country in south-east Asia to vaccinate 90 percent of its people within a year and to repeat the operation every 3 to 5 years. The resulting level of immunity would probably cause the disease to disappear completely.

FDA Warning on Irregular Use of Diabetes Test Papers

The use of certain chemically treated diabetes test papers by women to determine the fertility cycle may be injurious, according to the Food and Drug Administration. Some of these test papers contain the chemical toluidine, which has not been adequately tested for its effects on the sensitive tissues of the female reproductive system.

The papers are marketed for use by diabetics, who are able to determine the presence of sugar in the urine by moistening the paper with a small amount of urine. The chemically treated papers change color if sugar is present. No question has been raised about the safety of this procedure for diabetes.

It has been reported, however, that the secretions of the cervix also contain enough sugar during the ovulation period to cause the test paper to change color. This has resulted in publicizing the use of test papers for determining the fertile period of the menstrual cycle.

The Food and Drug Administration emphasized that the use of the chemically treated papers to determine the fertility cycle should be discontinued until appropriate tests have shown that the procedure will not cause injury to sensitive tissues.

The Feasibility of Smallpox Eradication

GLENN S. USHER, M.D., M.P.H.

IN JUNE 1958 the World Health Organization gave consideration to a proposal that it undertake a worldwide smallpox eradication program. The proposal was approved in principle, and the Director General was instructed to study the feasibility and possible means of accomplishing the task.

WHO's action lends timely interest to smallpox control experiences such as a group from the Communicable Disease Center of the Public Health Service had in the spring of 1958 in East Pakistan. This Province, formerly known as East Bengal, has long been known as a stronghold of smallpox and a place where control efforts are beset with difficulties as great as any to be found in the world. If eradication of the disease is feasible in the circumstances presently existing there, it should be feasible anywhere.

The occasion for the CDC team's trip was a smallpox epidemic of alarming proportions. Many countries, including the United States, extended assistance in combating both this epidemic and a cholera epidemic that was raging concurrently. U.S. assistance was coordinated by the International Cooperation Administration's Mission in East Pakistan under the direction of Dr. Thomas A. Cockburn, ICA's public health adviser in Dacca.

This team reported to Dr. Cockburn and with him to the Minister of Health and Home Government of East Pakistan. It was assigned the task of serving as the "eyes and ears" of the smallpox control campaign with the following duties:

Dr. Usher is special assistant for medical activities, Communicable Disease Center, Bureau of State Services, Public Health Service. He was co-leader of the CDC epidemic aid team in East Pakistan, May-July 1958.

1. Study the history and characteristics of smallpox epidemics in East Pakistan and the various related factors.

2. Define the nature, extent, and distribution of the smallpox epidemic.

3. Assess the resources that could be brought to bear on the control of the epidemic and the obstacles to be overcome.

4. Evaluate the current control campaigns in the districts and identify areas of success and failure.

5. Identify, in cooperation with Pakistani health personnel, epidemiological factors of importance to the smallpox control program.

In the execution of these duties the need to obtain data that would be as nearly representative as possible of the entire Province led to field trips to all 17 of its districts. Team members traveled by airplane, train, river steamer, jeep, oxcart, rickshaw, "country boat," and on foot. On most trips each of us was accompanied by a young Pakistani physician who had volunteered his assistance. The associations with these dedicated young men turned out to be most rewarding both to them and to us.

It is not the purpose of this paper to describe the control campaign that was conducted or the activities of the team. Some of our observations, however, are pertinent to the question of whether it would be feasible to attempt eradication of smallpox in East Pakistan at this time, and what would be required in order to achieve this goal.

Two Crucial Factors

The history of smallpox in Bengal and East Pakistan may be seen at a glance in figures 1 and 2. For as far back as records have been kept, the disease has occurred in cyclic waves. Figure 1 illustrates these cycles for the period 1912-46 in all of Bengal prior to the 1947 par-

tition. Figure 2 shows the smallpox deaths in East Pakistan from 1948 to 1958.

From these data may be derived the first crucial factor of the problem: smallpox is deeply entrenched in East Pakistan as an endemic and epidemic disease. Despite the fact that much vaccinating has been done (small sampling surveys performed by the team demonstrated that 60 to 90 percent of the population had been vaccinated), epidemics continue to recur in cyclic waves.

The other crucial factor of the situation is the extreme density of the population, which obviously must have great significance in maintaining the endemicity and epidemicity of the disease. With 45 million people crowded into a land area slightly smaller than the State of Illinois, the average population density is 777 persons per square mile.

"Density of Susceptibles" Concept

The significance of East Pakistan's great population density is demonstrated by the team's study of the manner in which the 1958 epidemic developed and peaked.

This epidemic was not a sudden occurrence. Although figure 2 shows the increased incidence for the Province as a whole starting in 1956, reports by district that were available to the team showed that the increase in Dacca started as early as 1955. From that year until 1958 there was a gradual buildup of the epidemic. Dacca and Tippera Districts are the most populous of the Province's 17 districts, with population densities of about 1,500 persons per square mile.

The appearance of conspicuous numbers of smallpox deaths in Dacca District was followed by similar occurrences in 1956 in Tippera District and in a few of the other more populous districts. The peak of the epidemic was reached in Dacca, Tippera, and two other districts in the spring of 1957, a full year before the peak of the epidemic in the Province as a whole. Conversely, the most sparsely populated district, Chittagong Hill Tracts, remained essentially epidemic free throughout the entire period. Only a few sporadic deaths were reported in 1958.

The team made a few samplings of the vacci-

Figure 1. Deaths per 1,000 population from smallpox in Bengal, 1912-46

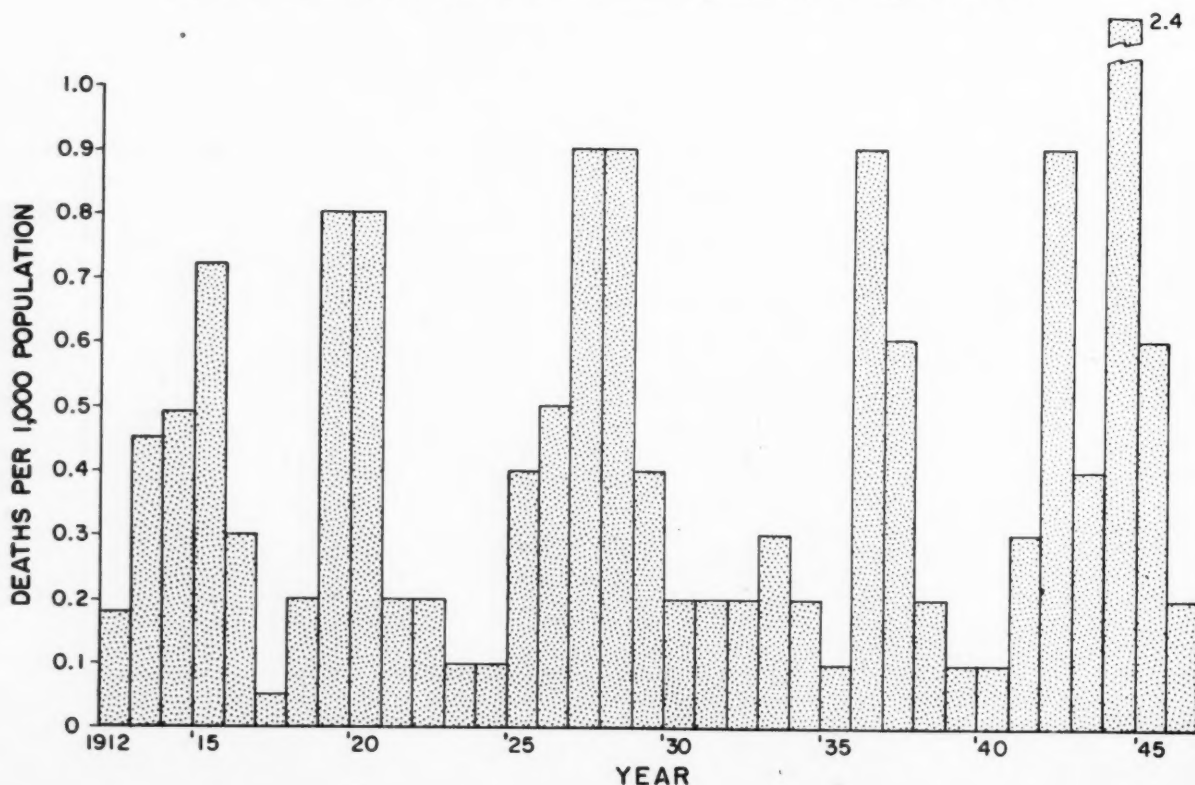
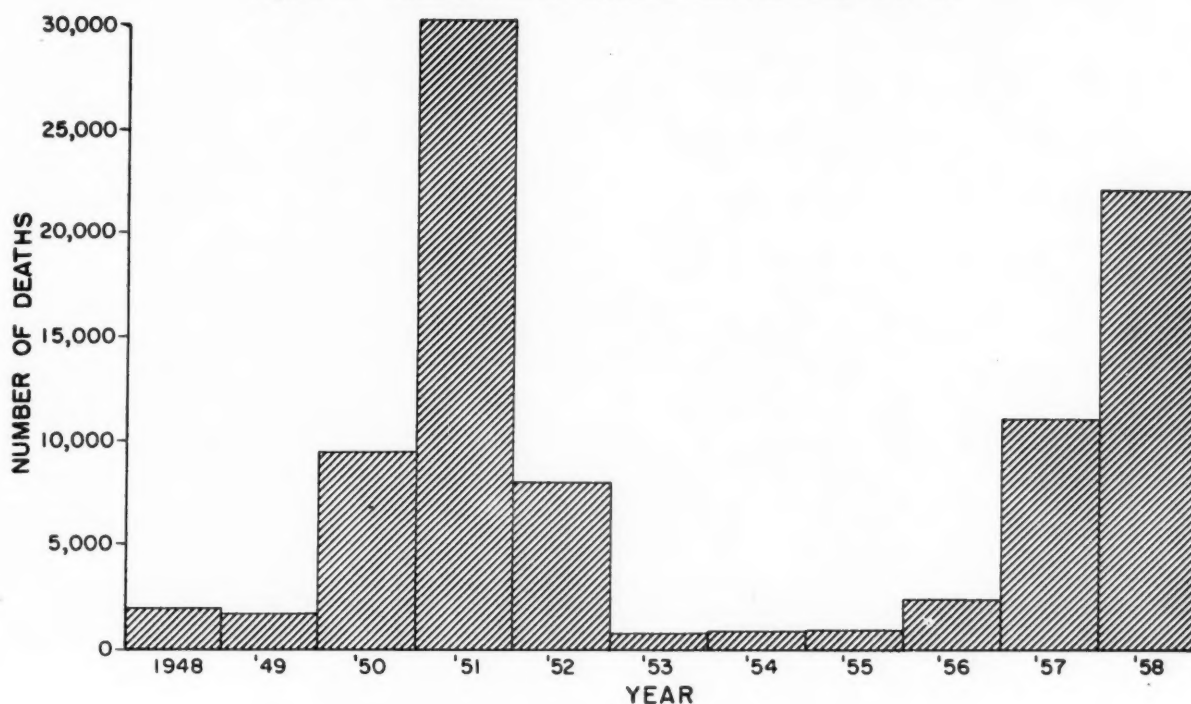


Figure 2. Deaths from smallpox in East Pakistan, 1948-58



nation status of the people in most of the districts, as evidenced by the proportion of persons having vaccination scars. On the basis of these surveys, the team made some very crude estimates (the best we could do in the available time) of the proportions of the district populations that had been vaccinated. These estimates ranged from about 60 to 90 percent (including old vaccinations), but we were unable to find any correlation between the proportion of the population that had been vaccinated and either the time of onset or the intensity of the epidemic in various districts.

As a result of the observations described in the preceding three paragraphs, it was the team's impression that, within this 60-90 percent range of proportions of persons vaccinated, both the time of epidemic onset and the intensity of the epidemic were more closely related to population density than to vaccination status. This conclusion leads to the suggestion that the density, that is, the number per square mile, of unvaccinated persons would be a better index of the susceptibility of East Pakistan's dense population to a smallpox epidemic than the index that is ordinarily used, the proportion of the population that has been vaccinated.

This, of course, is the well-known concept of the density of susceptibles. It should be useful in identifying sections of the country where vaccination campaigns need to be intensified.

Age, Sex, and Social Groups

Although the density of susceptibles is believed to be a better indicator than the proportion of vaccinated persons, it is admittedly only a crude index of the vulnerability of a population to smallpox epidemics. Obviously of great importance also is the uniformity of distribution of susceptibles among various segments of the population, such as age, sex, and social groups. If there are excessive numbers of susceptible persons in one or more of these population segments, their excessive vulnerability would be expected to result in a greater degree of vulnerability of the total population than the mean density of susceptibles would indicate.

In the East Pakistan epidemic we found that children under 10 years of age were not as well vaccinated as older age groups. This fact was reflected in the age distribution of cases and deaths (table 1). It was clear that special attention needed to be given to improving the vaccination status of children.

Table 1. Age distribution of smallpox cases and deaths in Mitford Hospital, Dacca, and in selected districts, East Pakistan, January-May 1958

Age group (years)	Cases			Deaths				
	Mitford Hospital	Pabna District	Total	Mitford Hospital	Tippera District	Faridpur District	Dinajpur District	Total
0-1	4	49	53	2	34	16	37	89
1-4	32	245	277	17	199	122	236	574
5-9	32	209	241	12	121	125	152	410
10-14	25	77	102	11	19	26	22	78
15-19	21	32	53	10	21	16	12	59
20-29	63	307	422	24	43	53	11	131
30-39	27			9	33	44	10	96
40-49	15			4	32	30	8	74
50-59	6			2	36	17	2	57
60 and over	4			2	36	11	1	50
Total	229	919	1, 148	93	574	460	491	1, 618

Since Moslem women of Pakistan are in purdah and consequently lead a secluded life, the team expected to find substantial differences in the vaccination status and prevalence of the disease in the two sexes. This, however, did not turn out to be the case. Sampling surveys revealed approximately equal proportions of unvaccinated persons in males and females. Table 2 shows that in the areas studied, except for Mitford Hospital, the male and female cases and deaths were approximately equal. (Field observations failed to lend credence to the suspicion that the seclusion of women might result in their cases and deaths being less well reported than those of men.)

Table 2. Sex distribution of smallpox cases and deaths in Mitford Hospital, Dacca, and in selected districts, East Pakistan, January-May 1958

District	Males		Females	
	Cases	Deaths	Cases	Deaths
Mitford Hospital, Dacca	142	57	87	36
Noakhali	350	82	417	98
Pabna	478		441	
Dinajpur		247		244
Faridpur		238		222
Total	970	624	945	600

The many religious sects and social groups of East Pakistan have sharply contrasting customs and habits of social behavior. Time did not permit a comparative study of the occurrence of smallpox in them and its relationship to population density and vaccination status. However, in conversations with local health officials the CDC team learned that some groups had responded poorly to vaccination campaigns and experienced high smallpox attack rates. Vaccination programs need to be intensified in localities where these groups reside.

From Control to Eradication

It has been said that when vaccination of 80 percent of the population has been achieved, smallpox will die out. In our opinion this is an oversimplification. In the more densely populated parts of East Pakistan it seems likely that a substantially higher percent of recently vaccinated persons would need to be achieved in order to eradicate smallpox by mass vaccination alone, and that this vaccination status would need to be maintained for several years.

Because of the extreme difficulty of accomplishing this in a country like East Pakistan, the surveillance phase of the eradication program should be introduced at an early stage—as soon, in fact, as the incidence of the disease has been reduced to a level where it becomes feasible to undertake emergency containment of each small outbreak as it occurs. Initiation

CDC Team

Members of the Communicable Disease Center team who participated in the collection and analysis of the data referred to in this paper were, in addition to Dr. Usher, Dr. Alexander Langmuir, chief, Epidemiology Branch of CDC; Dr. Frederick L. Dunn; Dr. Jacob A. Brody; Dr. Malcolm I. Page; Dr. Chandler R. Dawson; Dr. James W. Mosley; Dr. W. Yates Trotter; and Dr. H. Bruce Dull.

of this phase of the program should be timed to take advantage of the low incidence of an interepidemic period.

This is the manner in which smallpox was eradicated in the United States. Although it apparently was not accomplished by following a consciously conceived plan, what happened was that in the relatively sparse population of the United States it proved to be possible to reduce the density of susceptibles, and consequently the incidence of the disease, to a very low level by the vaccination of a smaller proportion of the population than would be necessary in East Pakistan. Thereafter it became possible to regard the occurrence of a case of smallpox as an emergency calling for immediate vaccination of the entire community. An especially dramatic example of this was the 1947 incident in New York City when the recognition of 12 cases of smallpox led to the vaccination of some 7 million people within a month.

In the surveillance or "firefighting" phase of an eradication program selective vaccinating of exposed persons (sometimes referred to as "ring containment") is, of course, desirable, but it is not considered advisable to rely entirely upon this for the emergency containment of outbreaks. This is especially true in a country like East Pakistan where health services are not fully developed, and there is a shortage of qualified health personnel for the performance of contact investigations. In such circumstances it seems essential to rely primarily upon "area containment," that is, an immediate, very intensive campaign to raise to the highest possible level the vaccination status of a community where an outbreak has occurred.

The successful execution of the "firefighting" phase of the eradication program in a country where the problem is as difficult as it is in East Pakistan may require rather drastic measures, such as area quarantine, during the time required to vaccinate a community in which an outbreak has occurred. Enforcement of emergency measures will need to be determined and persistent.

Is It Feasible?

Although the required strategic concept is simple and the technical procedures are not complex, the successful implementation of such a program in East Pakistan will not be easy. Traditionally, intensive vaccination activity there occurs only during epidemics. In interepidemic periods vaccinations continue at a more leisurely pace. To continue intensive vaccination activity when an epidemic is not raging would require understanding and sustained support by officials in the highest levels of the Government who have the responsibility of appropriating the funds to keep the work going. Furthermore, when it becomes necessary to apply drastic measures in the second phase of the program (the firefighting phase) there must be public understanding of the need for them.

Difficult problems of logistics also are involved. Transportation and communications facilities in East Pakistan are very poor. Personnel engaged in this program would need to be given priority use of those that are available, and funds are needed for purchase and repair of vehicles.

Where wet lymph is used, additional and improved facilities are needed for its refrigeration right up to the time when it is used in order to maintain its full potency. In some isolated sections of the country it seems essential that dried vaccine be used and perhaps consideration should be given to using dried vaccine exclusively. Whatever type of vaccine is used, it is essential that it be packaged in such a manner as to permit its satisfactory use by nontechnical personnel with little manual dexterity. For example, it is impractical to use a vaccine packaged in a vial that requires filing off a glass tip.

These are the requirements that appear to be crucial. The CDC team arrived at the opinion that the problems, although difficult, are not in-

surmountable. Eradication of smallpox in East Pakistan will be a difficult task, but it is considered feasible to undertake it at this time.

Summary and Conclusion

A proposal that the World Health Organization undertake a program of worldwide smallpox eradication is under study at the present time. The feasibility of such an undertaking under presently existing circumstances is dependent on the likelihood of success in countries where eradication is likely to be most difficult to accomplish and the obstacles greatest. One of these countries is Pakistan, in whose Eastern Province smallpox is deeply entrenched as an endemic and epidemic disease.

In 1958 a team of epidemiologists from the Communicable Disease Center of the Public Health Service was assigned to the International Cooperation Administration to participate in the assistance that the latter was extend-

ing to the Government of Pakistan in combating a smallpox epidemic in East Pakistan. Some of the observations of this team are pertinent to the question of whether it would be feasible at this time to attempt the eradication of smallpox in the Province.

It is concluded that such an undertaking is feasible at this time if certain problems are recognized and successfully dealt with. The concept of "density of susceptibles" is postulated, and certain other factors bearing on the problem are discussed. It is suggested that the strategic plan would need to be the same one that has led to the eradication of smallpox elsewhere, namely, reduction of prevalence by means of widespread vaccination, followed by surveillance and emergency containment of each outbreak as it occurs. For the latter it is believed that primary reliance should be placed on "area containment" rather than "ring containment."

PUBLICATION ANNOUNCEMENTS

Address inquiries to the publisher or sponsoring agency. WHO publications may be obtained from the Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N.Y.

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Conservation of Air Resources

FRANK TETZLAFF, M.C.E.

AIR POLLUTION has been defined as the presence in the air around us of substances put there by the activities of man in concentrations sufficient to interfere directly or indirectly with our comfort, safety, or health, or with the full use and enjoyment of our property (1). In many communities the simultaneous outpouring of many particles, fumes, dusts, vapors, gases, and ash, and the subsequent interactions of these pollutants in the atmosphere have created prolonged irritative effects on people; damaged vegetation, livestock, and structural and other materials; decreased visibility, with hazards to air and ground transportation; and impaired property values. Estimates of the probable cost to the communities of some of these effects have ranged from \$10 to \$65 annually for each person (2). But large as this figure may seem, it still does not include the cost of esthetic deterioration, the damage to the general fitness of the environment, and the desirability of the community as a place to live, to all of which it would be difficult to assign a dollar value.

The communities in the United States with long-established smoke abatement programs are relatively few. Many such programs have only recently begun, notably with the industrial and community expansion emerging during World War II. The U.S. Bureau of the Census statistics show that the growth of metropolitan areas

in the United States has crowded over one-half of our present population of more than 175 million into some 180 metropolitan areas, less than 10 percent of the land area. The tendency to urbanization will continue, with further complications of air pollution.

No single factor can be charged with full or principal responsibility for air pollution. Many common and essential activities contribute. While automobile exhausts may be significant in one community or in one part of town, industrial fumes and vapors may be disturbing elsewhere. In many large cities, garbage and refuse incinerators in apartment houses or even backyard incinerators have been major contributors. Municipal incinerators, powerplants, steel mills, ore smelters, and petroleum refineries are serious sources when improperly operated or lacking devices to control dust, smoke, or other discharges. Certainly operations such as the burning of open garbage and refuse dumps and the uncontrolled burning of automobile bodies in metal salvaging operations are offensive practices.

Although the effects of air pollution are generally subtle and difficult to measure, they can be apparent and even disastrous (3, 4).

The growing concern with air pollution has resulted in Federal legislation authorizing the Public Health Service to conduct a program of research and technical assistance (5). Since efforts to control air pollution have been hindered by the lack of technical knowledge concerning the causes, effects, and practical control measures, major emphasis has been placed on research.

In developing air pollution research, the Public Health Service has enlisted the aid of other Federal agencies, universities, and research in-

Mr. Tetzlaff is chief, Air Pollution Engineering Branch, Division of Engineering Services, Bureau of State Services, Public Health Service. This article was excerpted and updated from a paper presented at the annual convention of the General Federation of Women's Clubs, held in Hollywood, Calif., June 5, 1959.

stitutions in every part of the country. Some studies are designed to determine which air pollutants, if any, cause or intensify specific disease conditions or otherwise adversely effect the population (6). Through such studies, we may learn what pollutants must be removed from the air and what elements may be safely ignored. By observing the effects of polluted air in the laboratory and on human beings over a considerable period of time, sound conclusions can be reached. Significant leads have been uncovered. There is evidence of a relationship between air pollution levels and mortality rates from stomach and lung cancer, with allowance being made for smoking habits (7). We know that there are pollutants in urban air which can produce cancer in experimental animals.

A followup study on the population of Donora, Pa., has shown that the people who were made ill by the air pollution disaster in 1948 have had poorer health in general and higher mortality rates these past 10 years than their neighbors who were apparently unaffected. Many who died during acute air pollution episodes in London, Donora, and the Meuse Valley were elderly people with preexisting respiratory or cardiac difficulties.

Research in Great Britain has shown a direct relationship between air pollution and chronic bronchitis, a serious disease ranking third among causes of death in England and first among causes of economic loss due to illness (8). We have reason to believe that chronic bronchitis is also on the increase in this country (9).

During the past 4 years, the Public Health Service has established a national air-sampling network which for the first time permits a systematic measurement of air pollution throughout the United States. At present, the network consists of some 230 sampling stations, all manned by cooperating State and local agencies.

New methods of analyzing pollutants have been developed including the use of chemical, physical, and biological means which are proving to be more accurate and economical. Air pollution effects from specific industrial or community activities, such as oil refining, burning of municipal wastes, and operation of motor vehicles, are being evaluated. Fundamental studies are being conducted of the re-

lationship between weather conditions and the buildup of pollutants in the atmosphere. A method is being developed for forecasting weather conditions which permit the abnormal concentration of pollutants.

An automobile exhaust test facility developed by this program is becoming recognized as one of the best in the country. It permits simultaneous study of divers factors concerned with fuel and engine variables as they relate to the effects of irradiated auto exhaust on plants and animals.

For work on air pollution, short-term training courses are being given for personnel in health agencies. In addition, grants-in-aid have been made to 10 universities for the development and support of graduate level courses. Technical assistance on specific air pollution problems has been provided to State and local government agencies and other organizations.

Congress, in passing Federal legislation on air pollution, reserved to the States and local communities the responsibility for controlling air pollution within their jurisdictions. With the growing interest in conserving the Nation's air resources, States and communities have been surveying their air pollution position. Within the last 10 years, more than 20 States have adopted or modified legislation in this field. An increasing amount of legislative activity has also been observed in municipalities.

No modern city can hope to be completely free of air pollution. Industrial activities necessarily produce vapors, dusts, or gases which slip by the most effective control and retention devices now known. To require industry to establish absolute restraint of such byproducts can easily impose an intolerable economic burden.

There is a need for health agencies to determine the maximum concentrations of pollutants permissible and to apply these standards. This degree of control undoubtedly will prove costly, but it is no longer a question of whether we can afford to conserve the air. We cannot afford not to. It is the breath of life.

It is for this reason that continued research into the effects of air pollution is so vital. New knowledge may show that the application of controls which on the surface appear expen-

sive may actually save as yet unmeasured costs of damage to life and property caused by air pollution.

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First Aid Reminder

Mouth-To-Nose

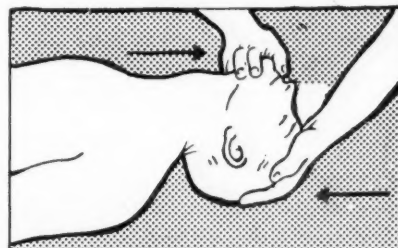
and

Mouth-to-Mouth Rescue Breathing

VICTIM ON HIS BACK IMMEDIATELY	
CLEAR THROAT	of water, mucus, toys, coins, or food.
TILT HEAD BACK	as far as possible.
PULL CHIN	to keep his tongue out of air passage.
BLOW	air through nose or mouth (or both) until his chest rises.
LISTEN	for snoring and gurgling - signs of throat obstruction.
REPEAT	10 - 20 times per minute.

Continue Rescue Breathing Until He Breathes For Himself.

DISTRIBUTED BY
ERIE COUNTY HEALTH DEPT.
Wm. E. Mosher, M.D., M.P.H.
COMMISSIONER
601 CITY HALL, BUFFALO 2, N.Y.



MOUTH TO NOSE
HE-8 (9.59) ECHO

MOUTH TO MOUTH

MOUTH TO BOTH
(Baby)

Rescue breathing instructions, printed on handy wallet-sized cards, have been distributed by the Erie County (N.Y.) Health Department. Both sides of the card are reproduced, actual size, in the illustration above.

Status of Public Health Officials

BY UNANIMOUS VOTE, members of the Health Officers Section of the North Carolina Health Association, in Winston-Salem, September 24, 1959, changed their name to the Health Directors Section, with the aim of shedding traditional association with the policeman's club. Modern public health practice, it was argued, thrives best under the glow of the educator's lamp.

As to the standing of health officials in the eyes of their associates, the medical societies, and the general public, however, there was no such unanimity. Members of a panel discussion on this subject disagreed pointedly as to the actual status of health officials, and the audience shared in an amiable controversy over steps which improve status.

With Dr. Arthur S. Chesson, Jr., health director of Wayne County, as chairman, the panel was composed of Dr. Edward G. McGavran, dean of the School of Public Health, University of North Carolina; Dr. M. B. Bethel, also with the school of public health, formerly health director at Charlotte; and Dr. R. D. Higgins, director of local health services for the North Carolina State Board of Health at Raleigh.

While admitting doubts that status can be objectively measured, Dr. McGavran suggested such indicators as the per capita budget for public health programs, expressed in uninflated dollars, relative to past budgets and to other current expenditures; the number and quality of applicants for positions in public health; and the extent to which the department holds or gains responsibility for community services. By such indicators, he said, the status of health officials has been on the downgrade. Per capita

budgets in constant dollars, relative to total national outlays, have been declining. Recruitment has been difficult, he said, although, at the same time, the shortage of personnel has failed to raise salaries as much as in other callings. And many community services associated with public health have been assumed by other departments of government.

Granting that "there is not a finer, more dedicated body as a whole than the public health profession," credited with achievements against great odds, he concluded nevertheless that still greater efforts were needed. While public health officials may enjoy high standing as individuals, he cautioned that the future status of the public health officer was precariously balanced.

To some extent, the dissent from this appraisal related to a definition of status or prestige. Applying the indicators used by Vance Packard as symbols of social status, Dr. Higgins ironically advised the audience to "be a supreme court justice or, as a second choice, a physician specialist; buy an expensive house in the best neighborhood away from the business section; drive a Cadillac or a foreign sports car; be gentile and Episcopalian; wear conservative clothes at work and sports clothes after work; buy clothes at the most expensive store in town and be casual about paying for them; arrive at work either earlier or later than other employees; and in your office have wall to wall carpeting, a private washroom, and an expense account that permits you to take your wife on business trips." By such standards, he observed, social status is appraised.

More seriously, he suggested that standing in the community depends on the amount of

(one)

Bladen Nebr.
Sept. 21, 1959

Nebr. State Medical Association
and Cooperating Organizations

Dear Friends:

I just wasn't satisfied till I wrote you a few lines to let you all know that I certainly appreciated having an examination for Diabetes at the Nebraska State Fair, it was the first examination I ever had and I just thought it was all wonderful. Could not be any better. I been wanting to take an examination at your Fair for the last 3 years but I always got sick and fainted before I even got started. But this year on Tuesday afternoon Sept. 8 I walked into your Hall

(Two)

of Health, wasn't even expecting on trying any more, but one nice little nurse came along and after she talked to me for about $\frac{1}{2}$ hour she finally talked me in to having the examination made, said she would take me through and guaranteed I would not pass out, so I finally gave in to her. I just simply put all my confidence in her and let her be my guide. she took me through and it didn't seem to bother me one bit. I never thought it could be done

"it was all wonderful"

The letter above is a fair example of the personal appreciation which many feel for public health services. The appreciation of this writer, who confirmed his feeling with a cash contribution, was acknowledged both by the Nebraska State Medical

Society, to which it was addressed, and the Nebraska Department of Health, which cooperated in the exhibit of the Hall of Health. In evaluating health services, the number and character of such letters can be considered along with budget statements, tables of organization, and morbidity rates.

intelligence and knowledge which the job demands and which the jobholder applies. He advised that it is only proper that the jobholder be paid in proportion to the service: the pay is an indicator of the value of the service. Also the authority and responsibility in the job, as it exists in reality rather than on paper, is an indicator of the incumbent's standing. Further evidence of the individual's standing, he said, is seen in the ability to enter into

the circles of power in the community and to influence the decisions of such circles. Most important of all, however, he listed public knowledge and appreciation of the importance of the individual's achievements. Given the achievement, he indicated, the outer symbols of status, such as salary, power, and influence, depend on the extent to which the public understands what has been achieved.

Panel members agreed that efforts which im-

prove standing with the staff, the professional fraternity, or the general public all work in the same general direction, but each undertook to deal with these circles of responsibility separately. The health director's prestige with his own staff, said Dr. McGavran, depends to a considerable extent on actions which show a sincere, personal interest in staff members and their families. He said if an administrator puts concern with the staff first and the job second, staff morale will make the job more effective. He also said that it is only sound practice to help staff members to improve themselves and to gain better positions according to their abilities, rather than to try to hoard valuable personnel.

Equal status of all professions on the staff, rather than a pecking order, he proposed, is a major element in staff performance and prestige of health directors. It is the only way, he said, to get the best use of the best brains, and he advocated weekly, well-planned staff meetings as a means toward this end. As generally acknowledged top banana, he said, the medical officer is in a strategic position to encourage professional equality.

In line with this principle, he urged that administrators not attempt to direct performance in specialties outside their own. "The medical officer is responsible for what the staff does," he said, "not how it is done." Given such responsibility, he said, the staff will demonstrate its superior competence and the health director rises in everyone's estimation.

As to standing in the professional fraternity, Dr. Bethel urged public health officials to increase their communications with their confreres. "Visit, write, or call," he urged. Failure to be in touch, he said, means to lose touch. The mere presence at a meeting, the act of communication in itself, he said, is valuable.

Of even greater value, he said, is mastery of the information which a health official is expected to possess. Questions as to population, hospital and other health resources, morbidity and mortality rates, sanitary conditions and techniques, immunological status, and career opportunities which come chronically in the direction of the health officer should be met with

immediate and authoritative answers. "If you would grow in the eyes of your medical confreres," he told the assembled physicians, "know more than they can possibly know about your business, nor do you fail to show it. We have a utilitarian device in board certification, and it is a solemn duty . . . in the advancement of public health to attain this specialty status," he said. Above all, he said, consult with other professionals on public health programs. "Established doctors," he said, "can give you sound advice that will enable you to fight and slash your way out of many a crude entrapment, and at the same time they will think you a pretty smart fellow for asking their opinions."

At the same time, he cautioned public health officials against asserting knowledge in the provinces of other specialists. "They don't expect it of you and might even decry your shameless effrontery if you are provocatively knowledgeable in their fields, particularly if you are demonstrably deficient in your own."

All members of the panel agreed that it is essential to be alert to community health needs and to study these needs by utilizing the best intelligence available. They were unanimous also in their endorsement of continuing professional education, whether in formal courses, at professional meetings, or through literature, utilizing available consultants and in turn helping others to develop their own professional skills.

They were agreed that a concern with specific health needs of the community at large, so manifested that health services will be sought rather than peddled, is a distinguishing mark of the successful health department. "For example," said Dr. Higgins, "compare the program largely content with responsibility for communicable disease control with one which assumes responsibility for dealing with chronic illness, mental health, and urban growth."

The major ingredient of Dr. Higgins' prescription, however, was his emphasis that the public is an essential channel in the process of exchange of scientific information. "Carefully planned public relations and education," he said, "are needed if the knowledge gained and used is to be adequately supported."

STATEMENT

*By Arthur S. Flemming, Secretary of Health,
Education, and Welfare, November 9, 1959*

Amphetamine Drugs

A CRACKDOWN by the Food and Drug Administration against the bootlegging of amphetamine drugs, the initial phase of which has just been completed, has disclosed a serious breakdown in our system of marketing controls for these drugs.

Concentrating initially on the bootlegging of amphetamine to truckdrivers, Food and Drug Administration inspectors obtained evidence that more than 200 operators of truck stops and similar establishments were selling the tablets.

In a number of instances, the inspectors also were able to learn where operators of the truck stops obtained the drugs, and as a result several wholesale peddlers of the tablets are under arrest and are being prosecuted by the Department of Justice.

Criminal proceedings also will be instituted against operators of the truck stops and other establishments found to be selling the drugs unless they are able to show cause why they should not be prosecuted.

In order to obtain this evidence, Food and Drug Administration inspectors have had to maintain various poses, often at considerable personal risk, in order to gain the confidence of truck stop operators, truckdrivers, and others associated with the sale of the tablets.

Agents of the Department of Justice who made the arrests found more than 800,000 amphetamine tablets in the hands of the wholesale peddlers, one of whom alone had 625,000 tablets in his house.

Commissioner of Food and Drugs George P. Larrick and his associates are convinced that the roundup of violators, successful as it was, has only scratched the surface of the total illicit traffic in amphetamine drugs.

The production of amphetamine last year

was about 75,000 pounds, enough to make about 3.5 billion amphetamine tablets, or about 20 tablets for every man, woman, and child in the United States.

Amphetamine is a central nervous system stimulant which taken under proper medical supervision has proved helpful, I am told, in selected cases of obesity, mental depression, and a number of other conditions.

It is when it is sold and used indiscriminately that the danger arises. When it becomes a bootleg product, this useful and powerful drug can readily become the accomplice not only of highway tragedy but of organized crime, juvenile delinquency, and quite possibly drug addiction.

According to medical experts in the Food and Drug Administration, amphetamine is much too potent a drug to be taken without medical supervision. For example, it may produce excessive nervous stimulation, loss of desire for sleep, impairment of judgment, hallucinations, and mental derangement. The amount of the drug required to produce these side effects varies widely from person to person. Under the Federal Food, Drug, and Cosmetic Act, it is illegal to dispense this drug without a doctor's prescription.

The prevention of desire for sleep is the basis for a large illegal trade in amphetamine among long-haul truckdrivers to enable them to stay awake beyond the limits of physical and mental endurance. While it is difficult to prove conclusively that any particular highway accident was due to the use of amphetamine by the driver, the drug has been found on drivers in a number of fatal highway traffic accidents, and there is other circumstantial evidence to implicate the drug in these accidents.

It is a well-established medical fact that prolonged wakefulness, beyond the fatigue limit, will result in a loss of muscular and mental coordination, impairment of judgment, and hallucinations. For example, a driver under the influence of the drug may see a mirage of an oncoming truck which may cause him to swerve off the road or into another vehicle which he didn't see.

Manufacturers, wholesalers, and retail drug-stores have a clear moral as well as legal responsibility to see to it that all dangerous drugs are kept in authorized channels leading ultimately to sale by a qualified pharmacist only on prescription.

In this connection, I should like to call particular attention to a decision rendered on September 30, 1959, by the U.S. Court of Appeals for the Fifth Circuit, in the case of Dr. Samuel J. DeFreese and Marsha Jean Simmons DeFreese versus United States. This case was on appeal from the U.S. District Court for the Middle District of Georgia. The defendants and appellants argued, among other things, that the wholesaling of amphetamine to a truck-driver was not "dispensing" within the meaning of the Federal Food, Drug, and Cosmetic Act. The court, I am happy to say, rejected this contention.

The Food and Drug Administration, with the excellent cooperation of the Departments of Justice and State and local police departments, is doing what it can to put a stop to the illegal

traffic in amphetamine drugs. This campaign will not only be continued but intensified in every way possible.

However, in view of the magnitude of the traffic in these drugs, I believe the present law does not provide the most effective way to get at the problem. We are therefore considering ways in which the legislative authority for dealing with this situation can be improved, and I expect that we will have a constructive proposal in this area to submit to the next session of Congress.

There are several ways in which existing law could be strengthened to improve the enforcement program. We are seriously considering such additional legislative requirements as the following:

1. That manufacturers, wholesalers, and retailers be registered to enable identification and that they be subject to Federal inspection.

2. That manufacturers, wholesalers, and retailers keep records of sales of the drug, with a penalty provision covering the falsification of such records.

3. A provision defining unauthorized possession of the drug as an offense.

4. A congressional action which finds that any illegal sale of the drug (whether or not the drug was in interstate commerce) is in effect a "burden" on legitimate interstate commerce, and hence subject to Federal control, thus making it unnecessary to prove interstate shipment in each bootleg sale.

Courses on Radionuclides in Food

A course in radionuclides in food will be offered again during April 18-29, 1960, at the Robert A. Taft Sanitary Engineering Center, Public Health Service, Cincinnati, Ohio. Presented first in September 1959, the course is designed for persons responsible for monitoring radioactive materials in milk and food.

Subjects include methods for sampling and assay of radioactive contaminants, data interpretation, radiation fundamentals and instrumentation, and sources of radionuclides in foods.

Applications should be addressed to the Chief, Training Program, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio, or to the director of a Public Health Service regional office.

Hospital Use in Massachusetts, 1945-1955

A. DANIEL RUBENSTEIN, M.D., M.P.H., HENRY R. MASON, M.P.H.,
and ELIZABETH L. STASHIO

DETAILED information concerning hospital use is urgently needed at a time when construction and operation costs of hospitals continue to rise. How has the shift of population in metropolitan areas from the core cities to suburbia influenced hospital utilization in medical teaching centers and institutions located in central areas? Why do some communities have higher rates of hospitalization than others? And, finally, are we prepared to develop criteria for determining reasonable or adequate levels of utilization?

To begin to answer these and related questions, a survey of hospital use in Massachusetts in 1955 was compared with a similar study undertaken 10 years previously when hospital service areas were first drawn up for the Federal hospital survey and construction program. Data on hospital admissions for the State's entire population residing in 351 cities and towns were gathered from the 163 general hospitals caring for acutely ill patients in 1945 and from the 149 such hospitals in 1955. All inpatient admissions with the exception of the newborn were counted. Data for the newborn were collected separately and were used to represent maternity admissions in these studies.

The grouping of cities and towns into 68 hospital service areas located in 6 regions of the State greatly facilitated the tabulation and analysis of hospital utilization data. Admissions to State and Federal military and veter-

ans hospitals and to long-term or chronic institutions were not included in these studies. Admissions for out-of-State residents were segregated from those for persons residing in Massachusetts. The community residence of all but 220 patients was available in the 1945 study, and of all but 833 patients, or less than one-tenth of 1 percent of all admissions, in the 1955 survey. Data concerning the community residence of maternity patients (as determined by the count of newborn) were also gathered for each of the 2 years.

Pattern of Admissions

In the 10-year period 1945-55, total hospital admissions for Massachusetts residents per 1,000 population increased from 109 to 124. Although there were 14 fewer general hospitals in the later year, the total number of admissions (including maternity cases) increased 22.2 percent, and maternity admissions increased 3.1 percent. The State's population in this decade increased 7.7 percent. In 1945, maternity patients constituted 20.0 percent of all general hospital admissions; in 1955, they represented 17.01 percent of the total admissions.

The greatest percentage increase in admissions occurred in hospitals located in the rural and urban fringe communities. This was true of maternity cases as well as total admissions (see chart). In fact, the increase in maternity admissions in these areas was strikingly greater than the increase in either of the other two types of communities. General hospitals in the large urban communities—Boston, Cambridge, Worcester, and Springfield—experienced the smallest increase in total hospital

Dr. Rubenstein is director of the bureau of hospital facilities, Massachusetts Department of Public Health. Mr. Mason, now with the American Medical Association, was survey administrator, and Miss Stashio is senior statistical clerk with the bureau of hospital facilities.

admissions. Their increase in maternity admissions exceeded that in the small urban communities, but was nevertheless much smaller than in the rural and fringe areas.

These findings reflect to a great extent the shifting of population from the large cities to the less densely populated areas of the State. Another factor has undoubtedly been the increase in number of suitable beds available in the rural and urban fringe areas. Almost half of the general hospital beds in these areas considered nonacceptable in 1945 because they were located in obsolete or inadequate buildings had been replaced with acceptable beds by 1955 (1).

In comparison with the other two types of communities, the small urban areas did not experience an increase in general hospital admissions proportionate to their population growth. Also, their increase in maternity admissions was insignificant (0.2 percent).

These findings suggest that an increasing number of residents of the small urban areas are using the hospitals in the large urban medical centers.

Study of hospital admissions according to residence of patients revealed that the rate of hospital use was generally greater for residents of the large urban areas than for persons residing in the small cities or in the rural and fringe areas both in 1945 and 1946. For residents of the large urban areas, admissions rose from 119 per 1,000 residents in 1945 to 134 in 1955. In the small urban areas, the admission rate increased from 104 to 119, while in the fringe and rural areas the admission rate rose from 107 to 121.

Special attention was drawn to two large urban communities and one small urban community which showed unusual changes in rates of hospital admissions over the 10-year period.

Percentage increase in population, total admissions to general hospitals, and maternity admissions, from 1945 to 1955, Massachusetts

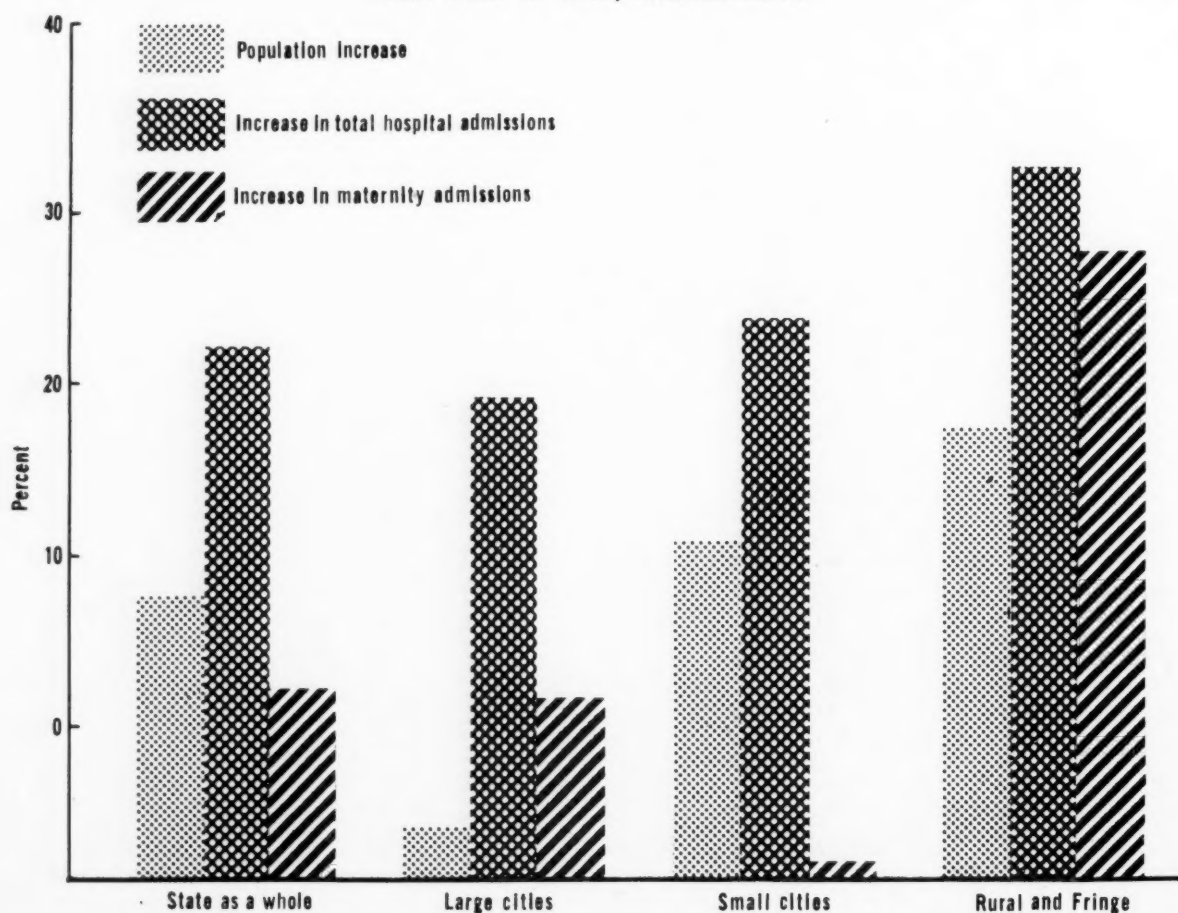


Table 1. Relation of general hospital admissions to beds available in selected Massachusetts communities

Communities	Hospital admissions per 1,000 population		Hospital beds per 1,000 population	
	1945	1955	1945	1955
Worcester.....	116	139	4.0	4.6
Springfield.....	121	118	3.7	3.2
Pittsfield.....	111	145	4.3	5.0
State as a whole..	109	124	3.8	3.9

In the Worcester metropolitan area, hospital admissions went from 116 to 139 per 1,000 population, while in the Springfield metropolitan area, only 50 miles from Worcester, the rate dropped from 121 in 1945 to 118 per 1,000 population in 1955 (table 1). In the smaller city of Pittsfield, general hospital admissions increased from 111 to 145. Examination of the ratios of hospital beds to population in these three communities revealed a possible influential factor in these changes. In 1945 Worcester had 4 general hospital beds per 1,000 population, and Springfield had 3.7 beds per 1,000. However, in 1955, Worcester's bed ratio rose to 4.6, while Springfield's dropped to 3.2 per 1,000. In Pittsfield, the hospital bed ratio rose slightly more than in Worcester, from 4.3 to 5.0 per 1,000 population. Such a positive correlation between utilization of general hospitals and the number of beds available has been observed recently by Shain and Roemer (2).

Study of the extent to which residents used hospitals in their own areas or in other areas revealed little change between 1945 and 1955 (table 2). There was, however, a small increase (1.6 percent) in use of rural hospitals by residents of rural and fringe areas and a similarly small increase (1.4 percent) in use of large urban hospitals by residents of small urban communities. There was also little change in the hospitals used by out-of-State residents, who accounted for 4.5 percent of all admissions to general hospitals in Massachusetts in 1945 and 4.2 percent in 1955.

Data on hospital use in Boston suggest that residents of the city who migrated elsewhere

in the State continued to use the city's general hospitals. In 1945 the population of Boston was 766,386, or 17.1 percent of the State's total. In 1955, the population was 41,684 smaller and constituted only 14.9 percent of the State's population. In the earlier year, 56.8 percent of the patients using Boston hospitals were residents of the city, whereas in the later year, admissions of Boston residents diminished to 50.2 percent of the total patients admitted. Conversely, patients residing elsewhere in Massachusetts constituted 40.9 percent of the patient load in 1955, as compared with 34.5 percent in 1945. (The remainder of the patients in each year were out-of-State residents.)

Summary and Discussion

Our studies thus far indicate that there has been a marked increase in use of general hospitals in Massachusetts between 1945 and 1955. In the State's four largest cities, hospital use increased substantially despite the fact that their aggregate population remained practically constant. The small cities and the rural and fringe communities experienced more marked increases along with relatively large population growth.

Hence, generally speaking, as the population has shifted from the cities to the less densely populated areas, hospital use has changed in the same direction. This relationship is true also of maternity admissions, at least in the rural and fringe areas. There are indications,

Table 2. Percentage distribution of patients according to residence, by place of hospitalization, Massachusetts, 1945 and 1955

Residence	Place of hospitalization					
	Large cities		Small cities		Rural and fringe areas	
	1945	1955	1945	1955	1945	1955
Large cities.....	91.5	91.7	7.2	6.7	1.3	1.6
Small cities.....	17.1	18.5	80.8	79.5	2.1	2.0
Rural and fringe areas..	19.5	19.5	19.5	17.9	61.0	62.6
Out-of-State.....	67.9	68.9	28.6	28.3	3.5	2.8

however, that an increasing number of inhabitants of small cities, some undoubtedly former residents of the large cities, are continuing to use facilities of the large teaching and medical center hospitals. While the small cities experienced a 10 percent population growth in the 10-year period, their hospitals showed only a 0.2 percent increase in maternity admissions.

These studies give substantial support to the thesis that the volume of admissions to hospitals in a community is directly related to the number of beds available in that community. It is apparent that hospitals located in the rural and urban fringe areas have been so well accepted by the public that the use of "population size" as the main criterion for measuring need for hospital beds has been validated.

Other variables, not considered in these

studies, have been suggested as factors also affecting hospital use. These include numbers and kinds of prepayment plans available, practice patterns of local physicians, and availability of outpatient services. Only after all such factors have been analyzed in relation to use of hospitals will it be possible to develop suitable criteria for determining adequate levels of hospital use and hospital bed needs in local communities.

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Rheumatic Fever Leaflet

HEALTH EDUCATION CASE HISTORY

Nine stages in the development of a leaflet on rheumatic fever recently published by a large industrial concern are described for *Public Health Reports* by a science writer who prepared it.

As a first step, it was agreed in consultation with the medical director's organization that an issue of the company's periodic health leaflet would be given to the topic of rheumatic fever.

Second, he read up on the subject in the latest medical books, in current medical periodicals, and in documents supplied by the American Heart Association.

Third, he attended as many meetings as he could where rheumatic fever was discussed.

Fourth, he showed a first draft and a layout of the proposed leaflet for comment to the American Heart Association, the local heart association, a medical consultant, and his wife.

Fifth, he incorporated the comments and criticisms received from these sources into a revised layout and text, which he submitted to the company for review and approval.

HEALTH EDUCATION CASE HISTORY

Sixth, changes suggested by the medical director's organization were made and the layout was approved by the company medical director.

Seventh, the text and layout were given to an artist, also engaged by the company, with suggestions for illustrations and colors as well as size specifications.

Eighth, the artist's layout and sketches were reviewed and okayed.

Ninth, all artwork copy was delivered to the company for printing and distribution.

This and similarly prepared leaflets on other health subjects of interest are distributed periodically to this company's employees throughout the United States. A survey has shown these leaflets to have popular appeal and acceptance by the employees. Requests for these leaflets come from students, teachers, nursing schools, health organizations, and others. A single request has called for as many as 300,000 copies. Since these leaflets are issued for employees rather than as a public service, they are supplied to the public only in limited quantities and then only when extra copies are available.

HEALTH EDUCATION CASE HISTORY

Screening Relatives of Diabetics in Five Florida Counties

L. L. PARKS, M.D., M.P.H., QUENTIN R. REMEIN, LYDIA S. SHIELDS,
and JAMES TURVAVILLE

THAT DIABETES "runs" in families has been recognized for many generations, but this knowledge is seldom applied to community diabetes detection programs if one judges by the literature. Screening relatives of persons with diabetes is a continuing activity in Florida. This report describes the detection project in Hillsborough, Jefferson, Madison, Suwannee, and Taylor Counties during the period January through June 1958.

Programs for diabetics in Florida began in 1935 when a member of the State legislature for Polk County, who was a diabetic, presented a bill to provide funds to purchase insulin for the indigent diabetics in the State. The legislature has appropriated funds for this purpose, included in the State board of health budget, for every year except one when the item was not included in the budgetary request. The appropriation for 1959 was approximately \$40,000.

In 1946 the Public Health Service conducted a diabetes screening demonstration among the general population of Duval County, including Jacksonville. The Service also provided educational services, conducted classes for diabetics, and made other studies. Subsequently the

State board of health used a trailer that toured various counties to conduct diabetes screening among the general population. The trailer service was discontinued about 8 years ago because of lack of funds.

One of the studies related to the 1946 demonstration undertook to determine the prevalence of undetected diabetes among blood relatives of known diabetics in Duval County. The basis for the study was the long-observed, familial pattern of diabetes confirmed by numerous genetic studies. In the Duval County study (1) during the 3-year period from 1947 to 1950, 1,741 relatives of diabetics were given laboratory tests for diabetes, and 73 new cases of diabetes (4.2 percent of those tested) were discovered. The percentage of cases detected among relatives of diabetics was found to be about five times as high as the percentage found in screening general population groups.

After several years during which casefinding activities based on screening relatives of known diabetics were not feasible, the Florida State Board of Health undertook in 1957 to capitalize on the unique opportunity afforded by the State's purchases of free insulin for indigent diabetics. In 1957 approximately 2,700 diabetics received part or all of their insulin through the State board of health.

Casefinding among relatives has several advantages which were helpful in reactivating the diabetes detection program in Florida. Screening can begin with small groups of persons and yet have a sufficiently high rate of yield to make a small program productive.

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Such a program is adjusted easily to the staff and funds available merely by contacting greater or smaller numbers of diabetics for the names of their relatives.

The pattern of administration of the insulin purchase program is ideal for involving local health departments in diabetes casefinding.

The State board of health purchases the insulin and keeps the records; local health departments distribute the insulin and contact the diabetics.

The 1958 diabetes detection project to screen relatives of diabetics was designed on a small scale. Its supervisor was a fieldworker from the chronic disease division of the State board of health. Local health department clinics did the screening, State and local staffs jointly participated in the followup of relatives, and the State laboratory ran the tests. The Public Health Service cooperated by supplying funds to assist the program operation and by analyzing the data for the period January through June 1958.

These criteria governed the selection of participating counties: (a) the number of indigent diabetics residing in the county; (b) location of the county; (c) the county health officer's desire to participate in the program; and (d) approval of the program by the county medical society. Because of local health department needs and interests, rather flexible procedures were established and the details of methods differed among the various counties.

In general, when the several criteria for par-

Table 1. Number of indigent diabetics, by age, race, and sex, five Florida counties, 1958

Age group (years)	White		Nonwhite		Total
	Male	Female	Male	Female	
Under 15-----	0	2	0	0	2
15-24-----	1	2	1	2	6
25-34-----	1	1	1	4	7
35-44-----	1	8	0	8	17
45-54-----	7	18	2	12	39
55-64-----	11	39	5	20	75
65-74-----	17	35	4	14	70
75 and over-----	9	19	2	2	33
Not stated-----	1	8	0	3	14
Total-----	48	132	15	65	263

¹ Includes race or sex not stated.

Table 2. Percentage of relatives tested by age group, five Florida counties, 1958

Age group (years)	Number named	Number tested	Percent tested
Under 15-----	176	122	69.3
15-24-----	127	59	46.5
25-34-----	138	56	40.6
35-44-----	142	67	47.2
45-54-----	122	60	49.2
55-64-----	79	35	44.3
65-74-----	45	21	46.7
75 and over-----	13	6	46.2
Not stated-----	93	26	28.0
Total-----	935	452	48.3

ticipation had been met in a specific county, a mailing list was prepared from the roll of diabetics receiving free insulin. A letter of explanation and a questionnaire was sent to each diabetic asking him to give the names and local addresses of his blood relatives, including parents, children, grandparents, siblings, aunts, uncles, and first cousins. Postage prepaid return envelopes were enclosed with the questionnaire. If possible, a visit was made to try to locate and interview diabetics who failed to return their questionnaires.

A letter was prepared and sent to each relative with a local address named by the diabetic. The letter explained the purpose and the importance of a diabetes detection test, invited the relative to have a test at the health department at a specific appointment time, and asked that he notify the health department if the time were inconvenient so that another appointment could be arranged. It suggested that the relative, if he preferred, go to his family physician for the test. The letter also listed several menus, each containing approximately 100 mg. of carbohydrates, and stated that one of these meals should be eaten 2 hours before the appointment for the test. When they had time, health department staff members visited and offered a blood test to relatives who had not reported to the health department or gone to their family physicians for a test.

In the screening, blood sugar determinations were made by the Somogyi-Nelson method. A level of 130 mg./100 ml. of venous blood or higher was considered positive. For some very young children, urine specimens were exam-

ined by the Tes-tape method. Relatives who screened positive were advised to see their physician for further study and diagnosis. If they felt they could not afford a private physician, they were advised to contact the health department for further information. Those returning to the health department were then handled according to local regulations. The referral physician or clinic made the diagnosis.

Results

During the 6-month period, 263 indigent diabetics in the five participating counties responded with information on their relatives. The distribution of the diabetics by age, race, and sex is shown in table 1. Their average age was 59 years. No effort was made to compare these respondents with diabetics from whom no information on relatives was elicited.

The diabetics identified 935 relatives, an average of 4 relatives per patient, and 452 relatives were tested. The percentage of relatives tested did not vary greatly by age except for a high response rate among children (table 2). In most screening programs in the general population the response rate in the older ages declines. It is possible that the direct, personal approach afforded by this casefinding method was responsible for the fact that the response rate did not fall off in the older age groups. Of course, the group was not large and other unknown, chance factors may have been operating in favor of this kind of response. Achieving

Table 3. Percentage of relatives tested by relationship to diabetic patient, five Florida counties, 1958

Relationship	Number named	Number tested	Percent tested
Father	13	7	53.8
Mother	28	17	60.7
Brother	83	25	30.1
Sister	121	57	47.1
Son	223	96	43.0
Daughter	291	155	53.3
Grandson	64	40	62.5
Granddaughter	61	41	67.2
Other blood relatives	51	14	27.5
Total	935	452	48.3

Table 4. Test results among relatives by age, five Florida counties, 1958

Age group (years)	Number of relatives tested	Number of diabetics found			
		Previously unknown		Previously known	
		Number	Rate per 1,000	Number	Rate per 1,000
Under 15	122	0		0	
15-24	59	1	16.9	0	
25-34	56	0		0	
35-44	67	1	14.9	0	
45-54	60	1	16.7	0	
55-64	35	3	85.7	2	57.1
65-74	21	1	47.6	2	95.2
75 and over	6	2	333.3	0	
Not stated	26	1	38.5	0	
Total	452	10	22.1	4	8.8

among the aged a response approximating the average rate for the entire group is particularly significant for casefinding purposes in view of the high prevalence of diabetes in this age group.

Table 3 shows the percentage of relatives tested by relationship to the diabetics supplying information. The female relatives had a higher response rate in each instance than the corresponding male relatives. The highest response rate was found in grandchildren, followed by parents, children, and siblings, in that order. The first column also shows the distribution of the relatives named according to relationship. As might be expected from the age distribution of the diabetic patients, the relatives most frequently named were children, siblings, and grandchildren. There were relatively few parents and only two grandparents (not shown separately).

Table 4 indicates that the rate for previously known diabetics among the relatives is 8.8 per 1,000 persons tested, which is equal to the recent national prevalence estimate for previously known diabetes (2). This is also similar to the rate of 9.6 per 1,000 obtained in other Florida casefinding programs in recent years. The yield in previously unknown diabetes was 22.1 per 1,000 persons tested. This is more than 2½ times the national estimated prevalence rate of

8.1 unsuspected cases of diabetes per 1,000 population and more than three times the yield of previously undiscovered cases in the average program reported to the Chronic Disease Branch, Public Health Service. In 64 screening projects with diagnostic information reported, the average program found 6 previously unknown diabetics per 1,000 tested.

Results by age among the relatives of diabetics follow a pattern similar to that in general population screening. The rate of diabetes discovered increases with age. Making use of this phenomenon could greatly increase the yield per person tested. If children under 15 years of age had been excluded, the yield would have been 30.3 previously unknown cases per 1,000 tested. If relatives under 35 years of age had been excluded, a yield of 41.9 per 1,000 tested would have resulted. This latter rate is over three times the rate of previously unknown cases found in screening adults in the general population in Florida. During the period September 1955 through January 1957, seven diabetes screening programs were conducted in the State among persons 30 years of age or over. In screening over 16,000 persons, a rate of 12.9 previously unknown diabetes cases per 1,000 tested was obtained.

All diabetes cases were found among the parents, children, and siblings of diabetic patients

Table 5. Test results among relatives by relationship to diabetic patient, five Florida counties, 1958

Relationship	Number of relatives tested	Number of diabetics found			
		Previously unknown		Previously known	
		Number	Rate per 1,000	Number	Rate per 1,000
Father.....	7	1	142.9	0	-----
Mother.....	17	3	176.5	0	-----
Brother.....	25	0	-----	1	40.0
Sister.....	57	2	35.1	3	52.6
Son.....	96	1	10.4	0	-----
Daughter.....	155	3	19.4	0	-----
Other blood relatives.....	95	0	-----	0	-----
Total.....	452	10	22.1	4	8.8

Table 6. Ratio of diabetic relatives per 100 diabetic patients responding to the program, by age of diabetic patient, five Florida counties, 1958

Age of patient (years)	Number of patients	Diabetic relatives			
		Previously unknown		Previously known	
		Number	Ratio per 100 patients	Number	Ratio per 100 patients
Under 35.....	15	0	-----	0	-----
35-44.....	17	2	11.8	0	-----
45-54.....	39	1	2.6	0	-----
55-64.....	75	2	2.7	2	2.7
65-74.....	70	5	7.1	2	2.9
75 and over.....	33	0	-----	0	-----

(table 5). These groups comprised the largest fraction of the relatives named.

Most of the diabetics were discovered among the relatives of patients who were 55 years of age and over (table 6). Patients under 35 years of age named no relatives who were found to be diabetics.

The results in finding previously unknown

Table 7. Comparison of the rates of previously unknown cases of diabetes among relatives of diabetics in Duval County, Fla., study 1947-50, and five Florida counties, 1958

Age group (years)	Duval County, Fla., study		Five Florida counties	
	Number tested	Rate of previously unknown diabetes per 1,000 tested	Number tested	Rate of previously unknown diabetes per 1,000 tested
Under 15.....	316	(1)	122	(1)
15-24.....	277	3.6	59	16.9
25-34.....	366	21.9	56	(1)
35-44.....	342	52.6	67	14.9
45-54.....	201	89.6	60	16.7
55-64.....	154	116.9	35	85.7
65 and over.....	77	129.9	27	111.1
Not stated.....	8	(1)	26	38.5
All ages.....	1,741	41.9	452	22.1

¹ No cases found.

diabetes cases in this study are not as great as those obtained in the Duval County study (1). The rates by age group in both studies are compared in table 7. No cases of diabetes among relatives under 15 years of age were found in either study. The greatest difference was in the age bracket 35-54 years in which the five-county project had a much lower yield. The factors accounting for these differences are not known.

Discussion

Screening relatives of diabetics has proved to be a practical method of finding cases of diabetes in Florida. Through a unique program of insulin distribution, indigent diabetics can be reached readily. Elsewhere, various ways can be used to develop similar programs. The relatively large diabetes clinics of most general hospitals and outpatient departments provide excellent sources from which to obtain a diabetic population. In some areas it may be possible to secure names of diabetics from local physicians cooperating in casefinding. Diabetics could be reached with informational materials through their physicians or pharmacists and invited to participate by referring relatives for testing. In general community casefinding programs all persons found to have diabetes should be interviewed to obtain information on relatives who could be offered a blood screening test.

In planning diabetes programs, we would reiterate suggestions often made but infrequently heeded, suggestions whose worth has been borne out again by experience in this project. Concerted education and information efforts greatly reduce misunderstandings and problems and improve participation all along the line. Personal interview or personal followup after distributing the initial questionnaire increases

participation by diabetic patients. Likewise, personal fieldwork improves the response rate of the relatives and their followthrough to diagnosis when indicated. Since a number of relatives were not screened because of working hours, some evening clinics seem to be highly desirable to improve response. Costs have not been studied in this project, but it is clear that a somewhat greater investment to insure a high response rate is warranted when the yield in previously undetected cases is high.

As previously indicated, the yield rate can be significantly increased by not testing persons under 15 years of age. Of course, this rule need not be followed strictly if it reduces rapport with diabetic patients and their relatives. It also may be desirable to test only grandparents, parents, siblings, children, and grandchildren if it is necessary to limit the program.

Summary

A total of 263 indigent diabetics in five counties of Florida named 935 relatives, of whom 452, or 48.3 percent, were tested for diabetes. The rate of previously known diabetes was 8.8 per 1,000 tested and the yield of previously unknown cases of diabetes was 22.1 per 1,000 tested. This yield is more than three times the usual yield in diabetes screening programs in general population groups. While the number of diabetics found was small, the results support previous findings that this is a practical casefinding method with a high rate of yield.

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Sanitary Engineering Degrees Awarded in 1958

Institution	Doc- tor's	Mas- ter's	Bache- lor's	Institution	Doc- tor's	Mas- ter's	Bache- lor's
Alabama Polytechnic In- stitute		0	¹ 10	New York University	0	3	2
Alabama, University of		0	0	North Carolina State Col- lege	0	2	
Arkansas, University of		2		North Carolina, Univer- sity of		6	
Brooklyn, Polytechnic In- stitute of		0		North Dakota, Univer- sity of		1	
California Institute of Technology	1	3	1	Northeastern University	0	0	0
California, University of	1	¹ 13	2	Northwestern Technologi- cal Institute	¹ 2	¹ 5	
Case Institute of Technol- ogy	0	0	0	Ohio State University	0	2	2
Cincinnati, University of		0	3	Oklahoma Agricultural and Mechanical College	0	0	4
Colorado, University of		0	0	Oklahoma, University of	0	¹ 4	0
Connecticut, University of		0		Oregon State College	(²)	(²)	
Cornell University	1	1	1	Pennsylvania State Uni- versity	0	0	1
Florida, University of	1	2	7	Puerto Rico Agricultural and Mechanical College			0
Georgia Institute of Tech- nology	0	0	7	Purdue University	0	4	3
Harvard University	3	¹ 7	1	Rensselaer Polytechnic Institute		0	3
Idaho, University of		0	0	Rice Institute		0	
Illinois Institute of Tech- nology	0	0		Rutgers University	1	¹ 4	1
Illinois, University of	0	0	2	South Dakota State Col- lege		0	2
Iowa State College	0	1	3	Southern California, Uni- versity of		2	
Iowa, State University of	¹ 2	0	9	Southern Methodist Uni- versity		¹ 1	
Johns Hopkins Univer- sity	1	¹ 6		Syracuse University	0	0	0
Kansas, University of		2	¹ 3	Tennessee, University of		1	
Kentucky, University of	0	0	0	Texas, Agricultural and Mechanical College of	0	¹ 2	
Maine, University of		1	3	Texas Technological Col- lege		(²)	(²)
Marquette University			25	Texas, University of	0	2	¹ 2
Maryland, University of		0	0	Tulane University of Lou- isiana		0	1
Massachusetts Institute of Technology	1	¹ 11		Utah, University of	0	0	
Massachusetts, University of	0	0	0	Virginia Polytechnic In- stitute	0	2	8
Michigan College of Min- ing and Technology		0	¹ 12	Washington, State College of	0	1	1
Michigan State College	¹ 1	1		Washington University		(²)	
Michigan, University of	0	¹ 14	3	Washington, University of	0	3	0
Minnesota, University of	0	¹ 13	1	West Virginia University		(²)	(²)
Mississippi State College		(²)	(²)	Wisconsin, University of	1	¹ 2	¹ 5
Missouri School of Mines and Metallurgy		1	5				
Missouri, University of		(²)	(²)				
Nebraska, University of		0					
Newark College of Engi- neering		2	12				
New Hampshire, Univer- sity of		(²)					
New Mexico College of Agriculture and Me- chanical Arts		1	3				
				Total	16	128	148

¹ Includes foreign nationals. ² Data not available from these schools for 1958.

NOTE: Leaders (-----) indicate no specialization offered at this level.

During the period from July 1957 through June 1958, 142 graduate degrees in sanitary engineering were conferred by institutions in the United States: 128 master's degrees and 16 doctor's degrees. During the same period, 148

students completed undergraduate programs specializing in sanitary engineering.

The table above shows the awarding institutions and the number and level of degrees which these institutions reported as conferred,

Engineering degrees awarded annually, by type of degree, 1951-58

Year	Number sanitary engineering degrees	Schools awarding sanitary engineering degrees	Schools offering sanitary engineering curriculums	Total number engineering degrees ¹	Number sanitary engineers per 1,000 engineering degrees
Bachelor's degrees					
1958	148	33	45	35,332	4.2
1957	145	31	43	27,748	5.2
1956	208	32	53	23,547	8.8
1955	141	32	44	20,200	7.0
1954	164	32	40	19,707	8.3
1953	216	36	41	21,642	10.0
1952	216	36	41	27,155	8.0
1951	244	35	39	37,904	6.4
Master's degrees					
1958	128 (29)	35	61	5,788	22.1
1957	152 (39)	41	64	5,203	29.2
1956	124 (31)	33	67	4,678	26.5
1955	134 (34)	33	53	4,444	30.2
1954	120 (25)	30	56	4,130	29.1
1953	102 (20)	25	57	3,726	27.4
1952	105 (22)	29	57	4,132	25.4
1951	152	26	57	5,134	29.6
Doctor's degrees					
1958	16 (4)	12	36	647	24.7
1957	11 (1)	6	32	596	18.5
1956	9 (1)	7	27	610	14.8
1955	11 (2)	4	28	599	18.4
1954	9	5	26	590	15.3
1953	5	4	24	592	8.4
1952	9	5	23	586	15.4
1951	7	4	25	586	11.9

¹ See Armsby, H. H., and Lewis, J. C.: Engineering enrollments and degrees in ECPD-accredited institutions: 1959. *Journal of Engineering Education* 49: 482-498, Feb. 15, 1959.

NOTE: Figures in parentheses represent nationals of other countries included in larger figure.

irrespective of the nomenclature of the degree. A list of all schools offering such training is available from the authors. Similar data for the period since 1889 appear in the literature (1-4) or have been distributed by the Public Health Service.

Comparative data on the conferment of

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degrees for the years 1951-58 are given in the tabulation above.

Undergraduate Degrees

Forty-five institutions offered undergraduate electives in sanitary engineering during the academic year 1957-58. Thirty-three of these schools reported that 148 graduates had received undergraduate training toward the bachelor's degree in sanitary engineering or had a sanitary engineering major or option. Undergraduate emphasis on sanitary engineer-

ing continues to show a downward trend. The average number of graduates per year for the 10-year period 1948-57 was 202, and for the 5-year period 1953-57, 175.

Master's Degrees

Thirty-five of the 68 schools offering graduate training for the master's degree in sanitary engineering awarded 128 degrees, 29 of them to foreign nationals. The remaining 31 schools (45 percent) reported no graduates.

Eleven schools had 4 or more graduates and accounted for 87 of the total number of degrees conferred at this level. Of these 11 schools, 6 have averaged over 5 master's degrees per year for the 10 years 1949-58. The average number of master's degrees conferred per year for the 10-year period 1948-57 was 134, and for the 5-year period 1953-57, 126.

Doctor's Degrees

In 1958, 12 institutions awarded a total of 16 doctor's degrees in sanitary engineering, 4 of

them to foreign nationals. Twenty-five other schools offered a sanitary engineering program at the doctorate level, but reported no awards of degrees.

Three of the 12 schools have awarded 1 or more doctor's degrees each year for the past 5 years and have accounted for over 55 percent of the doctorates in sanitary engineering over that same period. For the 10-year period 1948-57, the average number of doctor's degrees per year was 7.3, and the average for the 5-year period 1953-57 was 9 degrees.

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Exhibit on PHS Contributions to Medical Research

An exhibit on some of the contributions of the Public Health Service to medical research during the period 1900-1940 was held in the Service's National Library of Medicine from September through November 1959.

Selected papers, books, some in foreign languages, reports, memorabilia, and photographs demonstrated the work of a number of Public Health Service scientists who were associated largely with the Hygienic Laboratory and the National Institutes of Health. Their activities advanced knowledge of such diseases as hookworm disease, tularemia, pellagra, plague, Rocky Mountain spotted fever, encephalitis, psittacosis, and typhoid and typhus fevers. Contributions were also in chemistry and pharmacology—hydrogen ion determination, discovery of the thyroid hormone in the blood, and antineuritic vitamins.

Scientists represented in the exhibit were Dr. Milton Rosenau, Dr. John F. Anderson, Dr. George W. McCoy, Dr. R. E. Dyer, Dr. Edward Francis, Dr. James P. Leake, Dr. Charles Armstrong, Dr. Wade H. Frost, and Dr. William Wherry. Chemists, pharmacists, and zoologists were Reid Hunt, Atherton Seidell, Maurice I. Smith, William Mansfield Clark, and C. W. Stiles.

STATEMENT

By Arthur H. Wolff, D.V.M., Division of Radiological Health, Public Health Service, before the Special Subcommittee on Radiation of the Joint Congressional Committee on Atomic Energy, May 6, 1959

Fallout and Uptake of Iodine-131

In considering the uptake mechanism for fallout, almost exclusive attention has been given to strontium-90. Strontium-90 as an environmental contaminant certainly deserves primary attention because the problem will persist for years following the cessation of nuclear weapons testing. Even though strontium-90 is the nuclide of major significance, the potential hazard of some of the shorter-lived nuclides should not be overlooked. Some of the other fission-product radionuclides are not necessarily insignificant just because they are short lived; they may present a contamination problem if they are sustained in the biosphere at relatively high levels.

Of particular importance in this regard is iodine-131, a fission-product radionuclide with a half-life of approximately 8 days. Iodine-131 is unique among the fission-produced radionuclides in that it concentrates in a small gland, the thyroid. Consequently, extremely small amounts of the nuclide taken into the animal body will result in relatively high dosages to a single gland as compared with equal amounts of other radionuclides more widely distributed in the body.

As a result of its 8-day half-life the concentration of iodine-131 in a gross fission-product mixture gradually diminishes, and the amount of iodine-131 reaches negligible proportions several weeks to months following its creation. It is likely, therefore, that any iodine-131 in the biosphere results primarily from rather fresh fallout.

Several investigators have measured the iodine-131 levels in the thyroid glands of grazing animals as an index of fresh fallout in various parts of the world. Much of the work in this

field has been done by Dr. Lester van Middlesworth, University of Tennessee, Memphis. Since 1954 he has collected thyroid glands from animals in slaughterhouses from various countries and particularly from Tennessee in this country. From 1955 to 1958, based on his data the average concentrations of iodine-131 sustained in U.S. cattle and sheep were in the order of 700 and 3,000 micromicrocuries per gram of thyroid respectively. The average weekly dose was about 60 millirad per week for cattle and 250 millirad per week for sheep. These concentrations are average values; considerable fluctuations occurred according to the type and location of weapons testing in progress just prior to the time of collection. Other investigators (1-4) have found similar levels in other parts of the United States.

It is apparent that despite its short half-life iodine-131 has been readily detectable as a biospheric contaminant reflecting current weapons tests. The levels found are quite likely innocuous insofar as the health of the animals is concerned. However, iodine-131 as a biospheric contaminant probably has resulted in a higher dosage level to any given volume of tissue than has any other fission-product nuclide.

The levels of iodine-131 in grazing animals are considerably higher than any levels concurrently found in humans because grazing animals consume large quantities of foliage upon which fallout and rainout are directly deposited.

The values in cattle are of particular interest because, theoretically, we should also expect detectable quantities of iodine-131 to be secreted into the milk. The Public Health Service has therefore included iodine-131 as well as certain other short-lived radionuclides in its milk sur-

**Average iodine-131 concentrations in milk based
on monthly sampling**

Milkshed	June 1957- April 1958 ($\mu\mu\text{c./l.}$)	May 1958- January 1959 ($\mu\mu\text{c./l.}$)
Atlanta, Ga. ¹		22
Austin, Tex. ¹		39
Chicago, Ill. ²		38
Cincinnati, Ohio	136	41
Fargo, N. Dak. ¹		38
New York, N.Y.	79	31
Sacramento, Calif.	30	40
St. Louis, Mo.	258	99
Salt Lake City, Utah	249	33
Spokane, Wash. ³		32

¹ First sample June 1958.

² First sample July 1958.

³ First sample August 1958.

veillance program. The average iodine-131 levels detected in milk from various sampling stations are shown in the table.

Dr. E. B. Lewis, California Institute of Technology, has submitted a statement for the record which estimates the human dosages and possible biological significance that would be associated with consumption of milk containing the levels of iodine-131 reported here.

Iodine-131 levels in cattle thyroid may provide a presumptive index of the levels secreted

into milk in the same area. This is one parameter which the Public Health Service hopes to investigate in its future work in radiation surveillance of the environment.

The technique for measuring iodine-131 levels in thyroid glands is relatively simple. Perhaps greater reliance should be given to this technique, for it may serve not only as an early and sensitive index of the biological incorporation of iodine-131 but also may provide an index of the biological accumulation of other fission products. Iodine-131 as an index of environmental contamination, however, is only applicable to fission products of recent origin.

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Residence Requirements and Federal Aid

Both the Federal Government and our State governments must come to grips with some basic issues in connection with the administration of our Federal-State programs of public assistance. . . .

To the extent that funds are utilized for public assistance purposes, there should be no residence requirement by the States. The Federal Government is making funds available in order that persons who are in need may receive assistance. It has no concern and should not have any concern about how long persons have lived in a particular community or State. In fact, I feel that it is indefensible for the Federal Government to continue to permit the restriction of the use of its funds in this manner.—ARTHUR S. FLEMMING, *Secretary of Health, Education, and Welfare, at the Governors' Conference, San Juan, Puerto Rico, August 4, 1959.*

Reinforcement of Family Ties

GERALDINE GOURLEY

DURING the past several years, there has been increasing concern about an apparent weakening of the family as a strong, effectively functioning entity. This concern is shared by other countries across the world, where industrialization and other "benefits" of Western culture are accompanied by a breakdown in family life.

There have been many attempts to explain the reasons for this situation which we will not try to explore, but it does behoove each of us who has a responsibility for working with families to ask whether our efforts contribute to or threaten any aspect of family security and strength.

The importance of the family, both as a social force and as the basis for healthy personality development, is consistently stressed. We have swung from rigid routines in baby care to self-demand feeding, from early toilet training to self-discipline, and have made many changes in our ideas of what is "good for people." But at least intellectual acceptance of the value of the family has remained constant. Emphasis is, in general, on the primary family with some recognition that it does not exist in a vacuum, but is a member of a community. There is less expressed recognition that this family is also a member of a family, and of a social group from which it derives its identity.

Relationships inherent in the extended family have almost disappeared from segments of

our population. In certain groups these broad family ties still exist and are important. And, for those of us who may have lost these close ties, there is often a sense that here we may have lost something of value. How often have we heard our mobile friends say wistfully that "the family is so separated," a note of regret that there is, for their children, so little sense of family that reaches beyond the typical American home? One of the plausible explanations of the cause of weakened family effectiveness is the lack of roots in broader family relationships. What additional strains are placed on parents where support from and close identification with their own families are missing? What is lacking for a child who does not feel a close part of a family which reaches beyond his own household? If we can concede that these are important relationships to conserve and strengthen, we must consider the part we play in strengthening or threatening these ties and, thereby, in affecting the ability of the family to meet its obligations successfully.

The Figure of Authority

Studies have been made to evaluate the secondary effects of health programs which substitute professional authority for the traditional teaching by older family members, experienced neighbors, or other key persons in the social group. It seems safe to speculate that these changes in authority figures are not without significance. And we might further speculate that, when these persons are divested of authority and respect in such vital fields as family health and child rearing, this may carry over into other areas of relationship. Can members of the family or social group, whose ideas on

Miss Gourley is a medical social consultant in the child development center of the New Mexico Department of Public Health in Santa Fe. The paper was presented at the 17th annual meeting of the United States-Mexico Border Public Health Association in Brownsville, Tex., April 1959.

these matters have been labeled "wrong," "misinformed," even "bad," be expected to retain respectful consideration for their attempts to support social values basic to family functioning within the specific culture?

No one of us who has worked in public health questions that there are health practices which we must attempt to change. This is a large part of our reason for being. But we may need to weigh the actual health implications of some ill-favored practices against the possibility of strained relationships within the family or social group.

In the past few years we have become imbued with the importance of "culture." We find extensive material in health journals stressing the need for knowledge about and respect for the cultural background, beliefs, and customs of any group affected by health programs.

Culture is, of course, not the exclusive property of these groups sometimes described as "backward" and "interesting." As health workers we have a definitely ascribed culture which influences our own attitudes and behavior. Practices of child care, family management, medical care, and general patterns of family living which differ from the accepted theories and practices of the culture to which we belong, or aspire, may be labeled as "wrong," "misinformed," or, even worse, as "quaint" and "amusing" and therefore not to be considered seriously.

With our "scientifically oriented" beliefs about what contributes to or threatens health, there is a strong temptation for professional workers to have a sense of the rightness of our authority. After all, don't we represent a way of life which produces statistics showing significant decreases in morbidity and mortality, better teeth, and children who can tip the scales at a higher level? This very assurance of authority has contributed to parents having a tendency to become dependent on professional workers. If the professional worker feels that his role entitles him to this authority and derives satisfaction from having people depend on him for advice and help, he may voluntarily or involuntarily develop willing and compliant followers. But the professional worker cannot and would not be willing to fulfill the role of those persons who may be estranged by this

transfer of dependency, nor can he satisfy the emotional needs which can only be met within the family or social group.

Any attempt to bring about changes which may result in friction, resentment, or lessened sense of value to any important family member, or threaten the parents' position in the social group with which he is identified, should be made only with full knowledge of possible consequences. When, after such a careful evaluation, we feel convinced that change is important for the welfare of the family, we must make as earnest an effort to handle possible family tensions as we make to alter the health practice itself. Pressure for change tends to produce strain, since it implies criticism of previous methods. We can partially balance this strain by consciously reinforcing those things in the culture which are important and which provide stability.

To deprive the older family member of her authority on what constitutes proper feeding of the family and the appropriate way to treat a child's illness, and still show respect for her role, is not easy. It can be done convincingly only if we have real conviction of her importance. The effect of a tolerant but condescending smile, the summary dismissal of a family health practice or social custom, may have more disrupting effect on family relationships than we realize; on the other hand, the genuine respect of a professional worker for the authority figures in a social group may give them much-needed support in fulfilling their roles and contributing to family strengths.

In a number of instances, programs reflect an attempt to avoid or mitigate the threat to family and group solidarity from situations produced by change. Classes for expectant mothers, for example, have included expectant fathers and grandmothers, as well as other group members who represent authority. This would seem to be worth while since there is no time in a young woman's life when she is more in need of family acceptance and support. It is also a most important event for the total family.

An important consideration in the success of such an experiment is the purpose and method of including these additional persons. How are these family "authorities" viewed by the pro-

professional worker? Are they expected to sit as listeners while we attempt to impart our health culture? Or are they encouraged to participate as recognized and respected authorities, with every possible support given their ideas even though some of them may have little scientific basis according to our present knowledge?

I use the term "present knowledge" advisedly. Some of us remember the days when we, with complete professional sincerity, contributed to making grandmother a dangerous character to be watched or she might rock the baby or slip him a between-feeding snack. Many a child was saved from the rigid schedule only because grandma knew too much to go along with the "education" of that day. And at how many foods and home remedies have we looked down our professional noses, only to go back to encouraging their use at a later date? Even when we can feel reasonably certain that a custom has no scientific health value, this does not mean that it holds no social value for the members of the group. Unless the practice is actually harmful, it can at least be given respectful consideration. Many a skillful nurse encourages the expectant mother to follow her own mother's advice regarding the *muneco*, or cloth band, around her waist to keep the fetus in place, at the same time that she attempts to influence her diet and general prenatal care. And at some of the hospitals caring for our southwest Indians, highly skilled physicians have realized the value of inviting medicine men to participate in the treatment of certain patients.

With all our best efforts to gain social group support for a family, there will be times when we have to encourage a parent to take a stand which we know may produce conflict. In these instances, we can at least attempt to develop sympathetic understanding of the feelings which may be aroused and lend our help so that the situation can be handled with minimum guilt and resentment. We must be as much concerned with helping parents maintain the best relationships possible as in supporting them to remain firm about a controversial family issue. Identification with a young mother against her unreasonable relatives or neighbors will serve no purpose. An attitude of "I am on your side; pay no attention to those misin-

formed and misguided advisers" will not be of lasting help. She will need these relationships long after we have moved out of the picture.

When changes may bring conflict between husband and wife, we need to take an even longer look at the advisability of supporting such recommendations. It may be of questionable value to have a child with good teeth and strong muscles, who is fed, toileted, and disciplined according to the latest theories, if friction between parents prevents family unity necessary for healthy emotional development.

Family Cohesion

Probably the most critical events in the life of any family, those experiences which have throughout time drawn families closest together, are childbirth and illness. The development of modern facilities is removing both of these from the home and away from the family.

Many of us have probably been in some way connected with a home delivery. This was certainly a family affair, with relatives and neighbors participating, and father and children waiting for a signal to claim the mother and new baby. The contrast with delivery in some of our hospitals has caused many thoughtful persons to question what may be the effect on family life and on the ultimate welfare of mother and child. In some of our hospitals we have come through the period when, for reasons of obsession with sterility or hospital routine, the mother disappeared into the mysterious recesses of the hospital, not to reappear again until it was "all over." The baby was immediately relegated to a separate nursery, scarcely to be seen thereafter except through a glass wall. The only visitor permitted on the ward was the father, and he was often so awed by the professional atmosphere that he sat out his visiting hour, stiff and uncomfortable, not daring to touch the baby which had been made so formidable by sterile precautions.

I will not be so heretical as to suggest that the figures presented to show increases in hospital deliveries may not always indicate unmitigated blessings. But certainly we can question hospital policies which preclude family participation. Some of our leading physicians and hospital administrators are successfully taking steps to

reinstate the arrival of a baby as a family affair. Rooming-in has proved most successful where properly administered. More flexible visiting policies which encourage families to visit the mother and baby have brought no alarming increases in infections nor have had damaging effects on mother and child. The era of rigid seclusion, however, has left its imprint. Certainly not all hospitals in this country have shown recognition that childbirth has more than physical significance. And our contribution to health practices all over the world will long be felt. Recently a physician from one of the medical schools in the United States told of an experience while visiting a hospital in South America. The local physician, who had spent some time at a medical school in this country, showed him the maternity ward. Mothers and babies contentedly shared the same room, with a basket for the baby attached to the bed. Relatives were visiting comfortably, making proper exclamations of pride over the new family member. The doctor apologized for the "primitive" conditions and explained that a new ward was soon to be constructed where babies could be segregated in a nursery according to the best standards in the United States. The U.S. doctor could only protest, "Don't let them! We are now trying to build a new ward to accomplish what you already have here."

The old picture of the family doctor sitting by the bed of the sick child, with parents standing tensely together at the foot, still hangs on many a wall. No one wants to return to that day. The parent of any seriously ill child gives deep thanks for the facilities of the modern hospital. But no parent wishes to be excluded from

his child's care at such a time. It has been adequately demonstrated that effective hospital care does not mean taking over a child and excluding the family from any significant part of the experience. Yet any one of us could tell of cases where the sick child has become the property of the hospital, with visiting hours and conditions prohibitive of family involvement, no planned efforts to maintain the patient as part of the family, and no apparent recognition of family fears, customs, or rightful interest. We could also cite problems arising when we have tried to get these children back in the families at the time the hospital is ready to give up its claim. I hope we can balance these experiences with those where the child was given medical care with an understanding that he was and must remain part of a family, that there were a number of family members and friends important to him, and where the whole experience was one that contributed to the child's development and to the ties which draw a family closer together.

I do not lay at the feet of the already overburdened and conscientious health worker the total responsibility for the rise and fall of family life. The most and the least that we can do, as professional persons concerned with total family health, is to consider all our efforts in the light of their significance for family functioning. We are in a position to make meaningful contributions to family life. When the day comes that all aspects of health, as defined by the World Health Organization, physical, social, and emotional, receive equal concern and emphasis, we may be able to play an even more important role.

Anticipating Safety and Health Needs

HAROLD J. MAGNUSON, M.D.

FORESEEABLE changes affecting occupational health and safety needs may be considered as occurring in three areas: industrial technology, medical technology, and sociological change produced by a multiplicity of economic forces.

Technological Change in Industry

In the area of technological change, the event of greatest moment, perhaps, has been the onset of the electronic and nuclear energy age. New possibilities have opened up for the entire electromagnetic spectrum, ranging from the infrared waves to cosmic rays. We shall see an increasing use of manmade radiation not only as a source of power but also as a tool in the study of industrial processes and methods and in the control of product quality. Many predict that the peaceful use of nuclear energy will be a major influence in our civilization by 1980.

As one illustration, the microwave region has opened up broad new areas of research in many fields, with potential application to industry. Microwaves already are finding increased use in spectroscopy, radio astronomy, particle accelerators, radar, communications, and food sterilization. But, as is true of many other rapid developments, knowledge of the health effects of microwaves has not kept pace with their use.

Another technological development which has aroused considerable interest is automation.

Dr. Magnuson serves as chief of the Occupational Health Branch of the Public Health Service. The paper was read at the 1959 convention of the International Association of Governmental Labor Officials, which was held in Kennebunkport, Maine, September 9-12, 1959.

By no means new, automation has appeared in various guises, such as in automatic poison gas alarms and driverless lift trucks. Automation makes possible new products, processes, and production volumes, leading ultimately, as some expect, to larger work forces. Various industries, such as those engaged in the production of new synthetic fibers, antibiotics, and nuclear energy, critically depend on automatic controls for volume production and worker safety. That automation will find its way into more uses is indisputable. Only its degree of advance is uncertain because of the excessive cost of complete automation.

Because of its growing influence, automation deserves serious scrutiny from the standpoint of worker health. One of the most immediate problems coming to our attention is, in some instances, that of greater exposure to noise, resulting from the greater use of electrical motors and equipment in the factory. More nervous strain may also be expected from the character of automatic operations. The effect of errors is more serious, the responsibility of the maintenance worker is higher, and machines are more complex. Eye attention is also intensified by the concentration and close work and the focus on control dials, lights, and panels. As the need lessens for physical effort by workers tending automatic machines, a growth of the health problems associated with the sedentary worker may be expected. We may also expect psychological hazards to the worker from isolation, boredom, and even from increased leisure.

A third factor of health import on the technological scene is the fast-rising number of new chemicals. Figures reflecting the growth of the chemical industry stagger the imagination. Consider, for example, that there are 500,000 distinct chemical compounds in use in industrial

production, all but a few hundred of them unknown on this earth 20 years ago (1).

Among the newer, toxic chemicals we find the boranes or boron hydrides. Originally considered for high-energy fuels, these chemicals are now finding their way into industrial applications, as in new plastics. The foam plastics, which are gaining in usage, contain toxic aromatic isocyanates. Likewise, the versatile and numerous epoxy resins which have swept industry have created a problem. Practically no industry using them escapes an increased incidence of dermatitis. Sensitized workers must be removed from the job.

Other industrially important materials potentially hazardous include the organometallic compounds. The carbonyls of iron, cobalt, and nickel are now widely used as catalysts in the petroleum and petrochemical industries. Organic compounds of manganese are being studied as possible substitutes for or supplements to tetraethyl lead in gasoline. Most of these organometallic compounds are highly toxic substances.

These are but a few of a long, growing list of potentially toxic chemicals in the work environment. Continuous study and vigilance is required to determine their health effects and develop means for their control.

In addition to these new problems, we must not lose sight of the older hazards that continue to plague us. Two of the best illustrations are silicosis and lead poisoning. Although much has been accomplished through dust-control measures, silicosis remains the most significant occupational disease in the United States in terms of disability and compensation costs. Likewise, in the lead industries, despite numerous studies and the development of effective control methods, cases of lead poisoning occur every year. While large plants cannot be assumed to be free of occupational health hazards, a larger problem exists in the small plants and in the trades, where the hazards and methods for control may not be fully appreciated, rather than in the place of primary manufacture and use of chemicals.

Medical Developments

While changes in industrial technology present new challenges, advances in medical tech-

nology may be expected to provide some of the tools to meet these problems. Research on occupational diseases will undoubtedly gain momentum. Similarly, the massive research efforts to control the Nation's chief health problems hold special meaning for us, since 90 percent of industrial sickness absenteeism is believed to be of nonoccupational origin.

One approach is being made through studies to develop early, sensitive diagnostic techniques. In cancer, for example, studies are underway to apply the well-known Papanicolaou cytology technique for uterine cervical cancer to the detection of cancer of other sites. Some findings suggest that cytology can be useful in the early diagnosis of cancer of the genitourinary system. There is also hope for the development of effective anticancer drugs.

Heart diseases and related conditions are another major target. Studies in this area point, for example, to the development of an improved agent for the lowering of blood pressure in patients with hypertension. Considerable attention is also being given to reducing cholesterol, which some believe to be associated with atherosclerosis.

The benefits of some of the tools developed from this broad research may be compounded by applying them to occupational exposures. Thus, as an extension of the Papanicolaou technique, we have used bronchial washings to detect early cancer of the lung in uranium miners. In addition, work is underway to develop specific tests for occupational agents, to permit the detection and control of harmful exposure before irreversible damage occurs. Thus far, in our work in the Public Health Service, we have some indications that vanadium poisoning can be detected by changes in the fingernails long before any clinical symptoms appear. In support of better diagnostic techniques, work is also progressing in various laboratories to develop rapid analytical methods. Our own research, for example, has recently developed methods for the rapid determination of fluoride in urine, of cobalt exposures as evidenced by changes in blood serum, and a micromethod for blood lead determination.

As more sensitive diagnostic techniques are developed, we will be faced with the difficulty of equating concepts of physiological change,

as evidenced by these indexes, with the more traditional concepts of pathological change and possible compensable occupational damage.

With the advance of medical knowledge, we may also expect an increase in the number of diseases recognized as occupational. This increase would result from the greater recognition of an occupational factor in certain diseases formerly regarded as common to ordinary life, as well as the growing number of chemicals being introduced in industry.

In addition to improved recognition and detection of occupational diseases, we may look for further progress in their treatment. More recent therapeutic techniques, for instance, have used chelating agents in the treatment of certain illnesses. The chelating agents have the property of selectively removing certain metals from the circulation. For this reason, they have been found useful in treating metal intoxications, such as arsenic and lead poisoning. However, since such agents may also remove essential metals from the body, study has been needed of this possible hazard.

Sociological Developments

Against this background of change in industrial and medical technology, let us consider some of the sociological developments that influence health and safety needs. Unquestionably, the change in patterns of financing medical care is foremost. The vigorous growth of health insurance coverage reflects the conviction of the American public that the financial risks of illness need to be shared. To an increasing degree, such insurance coverage is being included in management-labor negotiations, so that both labor and management have a real concern about obtaining maximum medical care benefits at a minimum cost. At present, health insurance programs made available and paid for through the worker's place of employment cover more than 37 million employees and their 57 million dependents, a total of 94 million people (2).

The fact that management is increasingly obliged to bear all or part of the costs of illness, occupational or nonoccupational, has certain implications. The immediate effect has been to place increased emphasis on the prevention of

nonoccupational diseases, since these represent the greatest share of sickness costs and absenteeism. Another, and to us a more important, change may be anticipated. Up to now, it has generally been to management's advantage to deny occupational factors in the illness of workers so as to avoid compensation costs. However, as the costs of illness of all types become a management concern, we may expect a shift in this thinking. Management may logically come to view the early recognition of occupational factors as an opportunity to apply primary preventive measures and reduce the overall illness cost.

Another implication of management's concern with all types of employee illness is the possible tightening up of physical requirements for new job applicants. The degree to which this may be carried out is necessarily dependent on the labor supply. In the meantime, however, a very real problem involves the compensation aspects of employing workers with degenerative illness, such as heart disease.

A conservative estimate is that at least 5 percent of the working population has some form of heart disease. As a result of the cardiovascular diseases, an estimated 653,000 man-years are lost annually (3).

Numerous claims have been filed for heart attacks suffered during working hours, and there has often been a wide variation of medical opinion as to whether or not the heart attack was caused by the work. Because of the divergence of medical views, the heart case in industry has been a fertile field for litigation. All too often, cases have been tried on an emotional basis rather than on scientific fact.

In New York State alone, an average of more than \$4 million is paid every year for compensation of heart disease claims. This is 4 percent of the total amount awarded for all compensation claims each year (4).

Some action must obviously be taken if the millions of Americans with cardiac conditions are to be assured of continued employment. One possible solution may perhaps lie in the second injury fund, thereby protecting the final employer from the full brunt of the cost of a disabling illness.

Moving from this facet to the whole picture of workmen's compensation, we may expect to

see some changes here, too. The introduction of new hazards such as radiation, with long latent periods between the exposure and the appearance of damaging effects, is drawing more attention to the need for overhauling compensation practices in general and for correcting existing inequities.

Another problem calling for action relates to one of the basic goals of workmen's compensation—the rehabilitation of the occupationally disabled. We are seeing some progress in this area as the number of persons receiving help from public rehabilitation agencies and the number of those returned to productive employment increase each year. Last year, for example, 171,000 persons received rehabilitation services, and approximately 81,000 were rehabilitated to productive employment. However, our present inability to cope with the situation is reflected in the fact that some 250,000 persons each year reach the point of disability that requires rehabilitation, with an estimated reservoir of 2 million persons. Even more disturbing is the fact that, on the average, 9 years elapse between the time of disability and the time that rehabilitation is started.

A number of developments will be dictated by the changing age characteristic of our labor population. By 1965, the number of men and women in the labor force is expected to rise by 10½ million. Most of the increase will be in the 14- to 24-year-old group and in the 45-and-over age group (5). The increase in each group will be accompanied by its own set of problems.

The younger worker group generally is quite mobile and has a tendency to gravitate to the newer industries. The age and mobility of this group, combined with the long latent period for evidences of ill effects from certain occupational exposures, may well serve to cloak hazards inherent in those newer operations. Because of this and because some of the newer hazards could affect generations yet unborn in the families of exposed workers, we cannot wait for cases of illness to develop before taking steps to evaluate and control potentially hazardous exposures.

The problems of the older group will be felt in various areas. In the field of rehabilitation, for example, some accommodations may be necessary to meet the needs of an aging population.

Some have suggested extension of the present vocational goal of the program to also help people achieve a higher level of self-care.

Another sociological influence of this age factor is evident in the estimate that by 1975 the number of physicians' services needed because of chronic disease will increase by more than 50 percent (6). These demands of an aging population cannot but increase the problems associated with a growing physician shortage.

It has been estimated that merely maintaining the current ratio of physicians to population will require, by 1975, something like twice as many new medical school graduates each year as we now have (7). Pyramiding medical research needs may also be expected to drain off larger numbers of medical personnel. A consultant group to the Secretary of Health, Education, and Welfare, headed by Dr. Stanhope Bayne-Jones, estimated that by 1970 there would be a shortage of 6,000 medical researchers, as well as shortages of technicians, nurses, and other ancillary personnel.

The shortage of trained medical, nursing, and industrial hygiene personnel is also reflected in official occupational health agencies and in industry. Dr. Robert Kehoe has estimated that there is need for 10 industrial physicians and industrial hygiene engineers for every 1 now employed (8).

Industry, the health professions, educational institutions, and government may have to take another hard look at present educational opportunities and facilities to see how they can infuse them with a new vitality to meet these current and projected needs.

Training of additional personnel, we recognize, is only a partial answer. Better utilization of ancillary personnel may help conserve medical manpower and provide greater opportunities for service to the other members of the professional health team.

One means to accomplish better utilization and conservation is through the application of screening techniques. The value of screening techniques has been the subject of considerable controversy, but I believe that much of it is based on lack of understanding of their purpose and use. Screening examinations were never meant to be a substitute for physical examinations. Their value lies in extending

early detection services to persons who could not otherwise be expected to have the benefit of a physical examination. This value, however, can be realized only if adequate provisions are made for referral to the private physician for followup. There is no point to finding out that an apparently well person has an elevated blood pressure, a spot on the lung, or high blood sugar unless this condition is carefully investigated by a physician. Used properly, these examinations can serve as efficient detectors of disease in early stages, at the same time substantially decreasing the demand for and costs of medical and hospital services. I believe these techniques hold great promise for industry.

Since the shortage of professional personnel extends to governmental agencies, these groups, too, can effect better utilization of their personnel through closer working relationships between labor and health departments, compensation boards, and rehabilitation agencies. All too often, the administrators of these agencies within the same State do not even know each other's names. I am convinced that many benefits would accrue if the personnel of these agencies would become acquainted with each other and explore mutual problems and opportunities.

Such cooperative efforts would further contribute to the identification and more effective study and control of new occupational health hazards. At present, there are 76 official occupational health agencies in 40 States, staffed by 484 professional personnel. This staff reaches only 10 percent of the Nation's work force in any one year. This coverage can be greatly increased by a closer working relationship between the various agencies concerned with

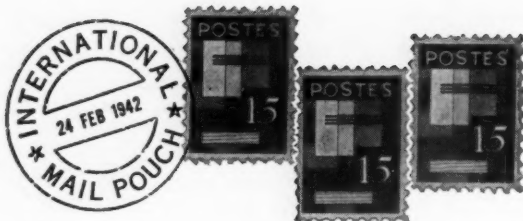
occupational health and safety. By joining forces, we may be able to attack more successfully the absence of even the most rudimentary type of industrial hygiene program in over one-half of the industrial plants in the United States. In the face of a constant, growing stream of new hazards introduced by a changing technology, we must effectively multiply our efforts if only to stand still and not lose ground.

The total health and safety job confronting us is nothing short of gigantic. There is more than enough for all of us to do. And to the degree that we combine our resources and permit a cross-fertilization of ideas and experiences, we will make greater headway toward our mutual objective of worker protection.

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★ Health services in the United States occupy 250,000 physicians, 475,000 professional nurses, 875,000 other professional and technical hospital personnel, and 800,000 other health agency personnel, a total of 2,400,000 potential readers of *Public Health Reports*. There is a subscription blank on the inside back cover.



Pushing Fish

To promote the eating of fish, Morocco's Ministries of Public Health and Interior sold fresh sardines at half price (7 cents a pound) for 2 weeks to some 100,000 dwellers in shanty towns on the outskirts of Rabat. Most of them have never tasted seafood and can afford meat only once every 4 or 5 months.

The Government's aim is to develop new food habits among those whose diet is deficient in protein, to show merchants how to profit from increased sales of fish at lower prices, and to stimulate the fishing industry which is operating below full capacity.

The ministries used press, radio, and movie publicity and broadcast from loudspeaker trucks such slogans as "One and a half kilos of fish is just as nourishing as one kilo of meat—and only one-fourth the price." Social workers set up stands in the shanty towns to demonstrate how to clean and cook sardines.

The Government plans to promote canned sardines in the inland areas where there is no refrigeration.

Morocco has a fishing fleet of nearly 2,000 trawlers and other boats which catch about 100,000 tons of fish, mostly sardines, a year. Many canning factories are closed because their products are not meeting price competition in foreign markets.

Hospital on the Amazon

Far up the Amazon, on Brazil's frontier with Colombia and Peru, at Benjamin Constant is the only hospital within 500 miles. A few patients are flown to the hospital; some arrive by river boat; but most are brought by paddling hours or days in the family canoe.

We make supervisory visits there only once a year. When I arrived at the hospital in 1957, about a year after it had opened, the X-ray machine was inoperative because of a grounded cable, the electrical connections for the hot water heater were not

completed, the oil burner in the kitchen was not functioning, and the flatwork ironer gave the employees shocks. The staff was anxious to learn, however, and soon, with adjustments, repairs, and instructions translated for the staff, nearly all equipment was working, and the hospital was functioning effectively.

When I returned a year later, accompanied by Dr. José Chaves, chief of medical services of the Amazon Program, all the equipment was still operational. However, an increased patient load was taxing the one doctor and one graduate nurse responsible for the care of both hospital and ambulatory patients. We offered suggestions as to clinic hours to permit more time for hospital patients and surgery and recommended to the Amazon Program Office of Serviço Especial de Saúde Pública that another doctor and graduate nurse be added to the hospital staff. The patient load, already so great that the present staff can no longer cope with it, will increase.

—KENNETH L. WINTERS, *hospital administration consultant, U.S. Operations Mission, Brazil.*

New Physicians for Indonesia

When 97 medical students were graduated from the University of Indonesia in August 1959, the new physicians, 21 of them women, took professional oaths according to their religions: Moslem, Protestant, Catholic, Hindu-Bali, or Buddhist.

The medical school of the university has collaborated with the University of California in the development of a new curriculum to increase the supply of physicians. (Indonesia now has about 1,000.) The period of training has been cut from 7 years to 6, with a new system of periodic examinations and clinical work integrated with theory.

Under a 6-year contract, the affiliation between the two universities was financed with \$1,900,000 contributed by the United States. In addition, the International Cooperation Administration provided \$900,000 to pay for advanced study in the United States for 125 students and \$500,000 to purchase equipment. Indonesia reported spending about \$6,250,000 for buildings, 10 houses for visiting professors, and administrative expenses. The University of California expects to start a similar affiliation in 1960 with the medical school at Airlangga University in Surabaya.

Synthetic Detergents in Well Water

JEROME DELUTY

THE presence of synthetic detergents, or "syndets," in ground water is being reported with increasing frequency, and the number of incidents may be expected to rise still more as housing developments are constructed in areas not served by either public water supplies or public sewers. A study in Suffolk County, N.Y., for example, found that many wells contained detergents (1). A committee has been formed by the Research Steering Committee of the Association of American Soap & Glycerine Producers, Inc., to investigate factors associated with such pollution (2).

In Rhode Island, the department of health has since January 1959 found synthetic detergents in samples from 72 wells in various localities in the State. These detergents were first noticed by the formation of a soapy foam in the bottle upon shaking, and their presence was confirmed by laboratory analysis. The presence of syndets in all these wells was believed to have resulted from their leaching through the ground into the ground water. Unlike soaps, which are precipitated by the calcium and magnesium in the water and left behind, synthetic detergents are only partly removed by a septic tank and absorption field. They are very stable chemicals and will travel appreciable distances through the ground into the water table and move with it.

The health department's analysis of well water, performed on application to the department, consists of physical examination, sanitary chemical analysis, and bacteriological examination. Specific tests include turbidity, sediment,

odor, color, nitrogen as free ammonia and albuminoid ammonia, nitrite and nitrate nitrogen, chloride, 20° C. and 35° C. plate counts, and coliform tests. Since January chemical tests for synthetic detergents have been performed routinely if the water appears soapy. A survey form, filled out by the collector of the sample, must accompany each sample. This form tells the type of well, its construction, and its location with respect to sources of pollution.

The following statistics pertain to the wells we have found to contain syndets:

- 47 percent were analyzed because of taste and odor complaints; 7 percent, because of foaming.
- 56 percent were positive for coliform group bacteria; 89 percent were considered grossly polluted on the basis of a sanitary chemical analysis.
- 21 percent were located in the cellar of the house.
- 44 percent were dug wells; 23 percent were driven wells; and 31 percent were drilled wells.
- 73 percent were within 50 feet of the sewage disposal unit; and 94 percent were within 100 feet of the sewage disposal unit.

Almost all these wells would be considered polluted on the basis of the chemical or bacteriological examination. If a well is so constructed and located that it is possible for it to be contaminated by the sewage disposal units, it is likely that syndets will be recovered from the well.

In certain areas, detergent contamination has been found to extend into most of the wells of a locality. One such area is the Quaker Hill Subdivision in Portsmouth, R.I., which consists of about 50 homes with no public sewers and no public water supply. This subdivision was developed during the period 1953 to 1958. The

Mr. Deluty is a chemist with the Rhode Island Department of Health. The paper is based on one he gave at the New England Health Institute, Providence College, Providence, R.I., in June 1959.

Analysis of 25 wells, Quaker Hill subdivision, Portsmouth, R.I.

Well No.	Depth (feet)	Turbidity	Sediment	Color	Free ammonia (ppm N)	Albuminoid ammonia (ppm N)
1	130	0	0	0	0.000	0.016
2	125	0	Soapy	0	.000	.016
3	140	0	Soapy	0	.000	.008
4	150	0	Soapy	0	.000	.016
5	200	0	Soapy	0	.008	.032
6	227	0	Soapy	0	.000	.024
7	300	0	Soapy	0	.400	.032
8	250	0	Soapy	5	.000	.032
9	145	0	Soapy	0	.000	.016
10	145	0	Soapy	0	.000	.016
11	135	0	Soapy	0	.008	.040
12		0	Soapy	0	.000	.000
13	60	0	Soapy	0	.160	.024
14	135	0	Soapy	5	.016	.024
15	160	0	0	0	.000	.016
16	225	0	Soapy	0	.000	.056
17	175	0	Soapy	0	.024	.056
18		0	Soapy	0	.000	.024
19	150	0	0	0	.000	.016
20	100	0	0	0	.000	.032
21	140	0	Soapy	0	1.000	.024
22	140	0	0	0	.000	.000
23	100	0	0	0	.000	.000
24	300	0	0	0	.000	.000
25	275	0	Soapy	0	.000	.008

Well No.	Nitrate (ppm N)	Nitrite (ppm N)	Chloride (ppm Cl)	Detergent (ppm A.B.S. ¹)	Coliform	Distance from disposal field (feet)
1	4.0	0.002	33	0.0	+	70
2	10.0	.007	25	.59	0	30
3	6.0	.004	22	.55	0	50
4	15.0	.002	23	.52	0	30
5	.5	.140	38	2.4	0	
6	7.0	.000	43	2.5	0	50
7	3.0	.200	32	2.75	0	65
8	5.0	.006	28	5.0	0	35
9	7.0	.007	39	2.65	0	63
10	10.0	.000	25	3.75	+	50
11	20.0	.017	42	4.00	0	50
12	10.0	.004	33	.57	0	60
13	15.0	.070	37	2.5	+	85
14	15.0	.001	28	.57	+	115
15	10.0	.002	21	.26	0	30
16	10.0	.002	46	2.60	0	62
17	10.0	.004	33	3.75	+	75
18	6.0	.002	30	1.75	+	
19	7.0	.000	25	.65	0	150
20	10.0	.001	25	.25	0	45
21	7.0	.002	37	2.00	0	50
22	7.0	.001	26	.15	0	50
23	6.0	.001	27	.27	0	40
24	10.0	.001	21	.25	0	80
25	10.0	.002	23	1.10	0	75

¹Determined by methylene blue, given as parts per million alkyl benzene sulfonate.

NOTE: All drilled wells located in rock. Bedrock is 8-10 ft. below surface of ground.

house lots vary in size from 7,000 sq. ft. to 15,000 sq. ft., with the average lot being approximately 8,850 sq. ft. The individual wells are drilled through the overburden into Pennsylvania sandstone, shales, and conglomerates. Water is furnished through openings along bedding plains and openings in the zone of fractures. These homes have septic tanks and absorption fields for sewage and waste disposal, but as the lot sizes are fairly small, most of the wells are within 75 feet of the disposal unit.

A total of 25 wells in this area were analyzed, and all but 1 contained detergents. The amount ranged from 0.15 to 5.0 ppm (see table). Upon shaking, most of the samples showed a soapy foam, but several did not. The detergent level of those that did not appear soapy was in the range of 0.15 to 0.4 ppm. We have found that generally a syndet concentration of at least 0.50 to 0.60 ppm is necessary to cause a soapy foam; the higher the concentration, the more abundant and more persistent the foam.

Only 6 of the 25 wells showed any laboratory evidence of bacteriological contamination, and few exhibited high nitrogen values. The only form of nitrogen that tended to be abnormally high for this area was the nitrate nitrogen.

Many of the wells in this subdivision would be considered safe on the basis of routine bacteriological and chemical examination. Because of the presence of detergents, however, we have considered them polluted or potentially

polluted. Presence of detergents, if their concentration is high enough, is evidence that seepage from the sewage disposal field is finding its way into the wells. Under these conditions, the wells must be viewed with suspicion and considered polluted if the sanitary survey so suggests. For example, there would be no reason to question the safety of wells Nos. 2 and 3 on the basis of the bacteriological and chemical examinations. However, since these wells contain detergents and are located near the sewage disposal system, we feel they are unsafe and we recommend their abandonment.

The Rhode Island Department of Health, in its subdivision recommendations, has recognized the difficulties of maintaining safe drinking water and safe sewage disposal facilities in close proximity to each other. The department recommends lot sizes of at least 2 acres in areas where there are no public water facilities and a distance of at least 100 feet between any well and any sewage disposal unit.

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Compilation of Air Pollution Research Projects

An inventory of air pollution projects active during 1959 is under preparation by the American Society of Mechanical Engineers Task Group on Research in Air Pollution. Researchers as well as organizations will be included.

Organizations and research personnel desiring to be listed may communicate with Austin Heller, Chairman, Task Group-Air Pollution Research, American Society of Mechanical Engineers, 29 West 39th Street, New York 18, N.Y.

Signs

and

Symptoms

of trends in public health

How do temperature, humidity, and barometric pressure affect morbidity, crime, accidents, and mental health? The Health Department of New York City, in cooperation with the Public Health Service, is compiling data in the search for an answer.

» «

For the first time in medical history, a comprehensive picture of sickness and health in a single community will be created eventually at Tecumseh, Mich. A complete health survey of more than 8,000 residents is scheduled under a 2-year grant to the School of Public Health of the University of Michigan by the National Heart Institute, Public Health Service. Each person will be told the results of the examination and family physicians will receive detailed medical reports. Special details on heart disease and related disorders will be sought.

» «

The end of the era of plentiful and cheap water in the United States has been reached, states a pamphlet prepared by Princeton University for a conference on ground water last spring. Dr. J. M. Roger De Wiest of Stanford University, a specialist in ground water flow, has joined the Princeton faculty to assist in developing a 5-year plan of teaching and research on water supply.

» «

Ten million people in the United States are rheumatic patients, one-half suffering from arthritis and 200,000 permanently crippled, estimates Dr. Philip S. Hench of the Mayo Clinic.

Conversion of salt water to fresh by a process known as long-tube vertical multiple-effect distillation gives promise of a remarkable breakthrough, according to Secretary of the Interior Fred A. Seaton. The process will be tested at Freeport, Tex., in a demonstration plant designed to produce 1 million gallons of water per day at an estimated cost of about \$1 per 1,000 gallons. This is 50 percent cheaper than the cost of converting sea water to fresh in the most efficient commercial plant in operation in the world today.

» «

Four fallacies concerning mental illness were listed recently by Dr. Mathew Ross, medical director of the American Psychiatric Association: (1) The mentally ill could "snap out of it" with a little effort. (2) It's stylish to go to the psychiatrist; mentally ill persons can be recognized because they are violent. (3) Anyone who is not mentally ill is mentally healthy. (4) Tranquilizers are wonder drugs that cure mental illness.

» «

Under certain conditions, epilepsy is not a barrier to Federal employment. A policy followed by the Civil Service Commission for a number of years was explained in a pamphlet issued by the Commission in August 1958, "Employment of Epileptics in the Federal Service." Although the policy is not a new development, the issuance of the pamphlet and ensuing correspondence with the National Epilepsy League resulted in considerable publicity at the time of the meeting of that organization in

Chicago in August 1959. The Commission continues to hold, as stated by its medical director, Dr. Eugene R. Chapin, that epileptics are employable if their seizures are adequately controlled and job placement is selective.

» «

Today's retirement policies and practices and their impact on the Nation's economy will be examined at Cornell University for the next 3 years under a Ford Foundation grant. Sponsored by the New York State School of Industrial and Labor Relations at Cornell, the study group will evaluate retirement policies of both industrial and nonprofit organizations, as well as community attitudes.

» «

Thirty countries are now participating in the Public Health Service's international fellowships program since 17 countries of Central and South America and the Australasian area were added. Started in 1958, the program gives postdoctoral medical research training in this country to scientists from abroad. Applicants, nominated by their country's panel of scientists and approved by a fellowship board of the National Institutes of Health, receive from the Public Health Service a basic annual stipend of \$4,500, allowances for wives and children, and limited travel funds.

» «

Accidents in pleasure and instructional flying will be the subject of nationwide study through a recent grant by the Public Health Service. The grant of \$77,600 to Flight Safety Foundation will permit development of a long-range research plan for experiments in prevention by specialists in biostatistics, physiology, psychology, mathematics, education, and public health.

» «

A comprehensive community plan for meeting the problems of chronic illness, the result of 15 years of exhaustive study and experience in the Chicago area, is given in volume 22 of *The Proceedings of The Institute of Medicine of Chicago*, dated May 15, 1959.

Locally Oriented Health Careers Manual

WILLIAM J. MEYER, M.D., M.P.H.

PERSONAL interviews with several guidance counselors brought out the need for (a) locally oriented information about careers in the field of health, and (b) a sourcebook containing all the specific information, both scholastic and financial, useful to a high school student in deciding on a career consistent with the criteria of choice and ability.

Guidance counselors are busy people. It is impossible for them to check through their considerable library of source materials to find, for each student being counseled, detailed information on job descriptions, course requirements, institutions offering training in the career in question, academic costs, scholarship and other financial aid available, and all the other facts a young person needs to help him plan a career.

Early in 1958 the Glens Falls District Office of the New York State Department of Health undertook to provide these facts about careers in health in the form of a health careers manual. This decision was made because of the realization that, if the counselors were to be more effective in recruitment for health, they must have a better tool than any at that time available to them.

It is true that they had the excellent "Health Careers Guidebook," published by the National Health Council, and the other equally good recruitment materials published by the council and other agencies. However, the Guidebook was published in 1955 and certain parts of it, such as salaries and training costs, were already somewhat out of date; it also lacked specific information on financial aid and local sources of additional information, all important facts to a young person considering a health career.

Dr. Meyer is district health officer of the Glens Falls District, New York State Department of Health.

Obviously, local orientation is impossible in a sourcebook designed for national distribution.

Guidance counselors are an important group in any program of career recruitment because they exert a significant influence on high school students' decisions. Like everyone else, they must perform their services within the limitations of the resources available to them. It is only natural that they will be more successful and will put a little more emphasis in those areas in which they have effective tools.

Therefore, it was decided to design a manual that would encourage the counselors to emphasize health careers. It was also decided to borrow material freely and to devise a book that would be easy to handle and simple to revise annually.

Format

The manual consists of 35 folders made from index paper, each containing a pocket on the left side. Front and back covers are of heavy, embossed fiber paper, and the book is bound together by a multiple-grip plastic binder.

Stapled inside the front cover are these instructions.

INSTRUCTIONS IN THE USE OF THIS MANUAL

This notebook has been designed with the hope of providing guidance counselors and students with a tool whereby they can obtain sufficient information to help them decide on a career in health. The format is such that any specific information can easily be found. For each health category there is also information on whom to contact for additional details.

The first section of the book consists of two lists of scholarships, neither of which is all inclusive. The first includes general scholarships which are available to high school graduates planning on entering the field of health (as well as other fields).

The second list gives information on scholarships available in specific careers.

The rest of the book consists of a descriptive page for each health career, accompanied by recruitment literature which in most instances has been supplied by the officially recognized national or State association in each field. In a few instances there is no such literature because none is available. The descriptive page gives the following information under separate headings:

- The job
- Salary
- Opportunities
- Training needed
- Cost
- Schools (partial list of nearby schools)
- Further information (where to obtain)

The lists of scholarships, as mentioned above, are far from complete. However, it is hoped that annual revision of this notebook will be possible and that with each annual revision the scope of these lists will be expanded.

In listing the general scholarships for local high school graduates, an attempt was made to include information on those available through the schools specifically mentioned in the descriptions of the individual careers; however, the list is not complete. The list of scholarships available to local graduates for training in specific health careers is arranged according to particular careers. This list is national in scope and is more definitive than the general scholarship list.

The rest of the manual consists of 34 folders, each one devoted to a single career, although in a few instances one folder contains information on several related careers. Stapled on the right, inside each folder, is a 1-page, mimeographed job description sheet. The 40 careers described, including hospital careers as 1 group, are the following:

Administrator, public health	Medical technologist
Chiropracist	Nurse, registered
Dental assistant	Nurse, psychiatric
Dental hygienist	Nurse, industrial
Dental laboratory technician	Nurse, public health
Dentist	Nurse, school
Dietitian	Nurse, practical
Hospital careers	Occupational therapist
Industrial hygienist	Optometrist
Medical librarian	Orthoptic technician
Medical record librarian	Osteopathic physician
Medical record technician	Pharmacist
Medical secretary	Physical therapist
	Physician
	Psychologist

Public health educator	Social worker, psychiatric
Radioisotope technician	Speech and hearing therapist
Research, health (chemistry, biochemistry, physics, physiology)	Statistician, public health
Sanitarian	Veterinarian
Sanitary engineer	Vocational rehabilitation counselor
Social worker, medical	X-ray technician

In the pocket on the left side of each folder are recruitment pamphlets obtained from the national or State headquarters of the official organization for a particular discipline. If no official organization exists for members of a specific discipline, recruitment material was obtained from more general sources such as the Hospital Association of New York State, the American Society of Clinical Pathologists, and the Public Health Service. This literature presents information that supplements and expands upon that given in the job description sheet. In a few instances these pockets are empty, because diligent inquiry failed to unearth any existing recruitment literature.

Plans for Revision

It is planned to revise the manual annually and to have the revisions in the hands of the guidance counselors in time for the second half of the school term when most vocational guidance activity occurs.

The format of the manual makes it easy to revise. Recruitment pamphlets can be changed merely by substituting new ones for old. Minor changes in the job description sheet can be inked in. If a revision is extensive, the old sheet can be discarded and a new one stapled in. It is equally simple to revise the two scholarship lists by inking in minor changes, substituting pages, or stapling in a complete new list. The revisions with an instruction sheet will be mailed to the counselors.

Discussion

When they first received the manuals, the local guidance counselors were enthusiastic. They were particularly pleased with its scope and local orientation and the fact that all the information was available in a single source.

After using it from January 14 to May 1, 1959, they received the following questionnaire:

1. Have you any definite knowledge that the manual has increased interest among your students in a health career? Yes — No —

2. If yes, what is your rough guess, *without consulting your records*, of any increase over previous years in the number of this year's graduating class planning to enter a health career? —

3. Now that you have had the opportunity to use the manual, has it been of value to you in your work? Yes — No —

4. Would you please list any suggestions you have for improvement of the manual.

The replies to these questions did not provide objective, quantitative data; the questionnaire was deliberately so planned because it was felt that if the people using the manual indicated its value to them, this expression would be sufficient to justify continuation of the project. Also, since guidance counselors are busy, no more information was solicited from them and compiled than was necessary to accomplish our purpose.

Twenty-three of the 28 school guidance departments answered the questionnaire. Seventeen answered "Yes" to question 1, five answered "No," and one stated the manual had not been in use long enough to determine.

The answers to question 2 included 12 positive statements. Five stated that it had stimulated interest in lower classes (10th and 11th grades). Six did not answer this question.

All 23 respondents answered question 3 affirmatively.

Answers to question 4 were as follows: 11 stated the manual to be excellent and needed no improvement, 1 suggested more "picture-type" folios, 1 wanted more empty pockets to hold additional material, 2 stated the manual should be kept up to date, and 1 wanted a smaller manual. Seven did not answer.

Collecting the material for the manual was a task of considerable magnitude. The most difficult job, however, was the process of selection. Much more good recruitment material is available than can be included in a volume of this type and still keep it to a size that is easily handled. The author found the health careers materials of the Empire State Health Council and the State Charities Aid Association of particular value. The pamphlets selected are purely a matter of personal judgment; other persons would undoubtedly make a dif-

ferent choice. The titles and sources of the recruitment literature inserted in the health careers manual are listed at the end of the article. Job description sheets had to be rewritten many times to achieve the desired degree of brevity, and many excellent leaflets and pamphlets had to be ruthlessly weeded out.

No claim is made to any originality in any of the material included in the manual. We borrowed freely. The only merit to the manual is that it is a compendium of much existing material and provides a single source for all the information a young person in this locality needs to help him decide on a future career in health.

There is no doubt as to the value of the local orientation of the manual. All scholarships originating within the health jurisdiction are listed; any scholarship whose restrictions make local students ineligible for it has been omitted. Finally, when the training is available from many schools, only those nearest at hand are listed. No information on student loans is included.

Creation of the manual is only the beginning of the district office's activities in recruiting for health careers. A number of local official and voluntary health organizations have an interest in this effort, and several have established active programs. It is hoped that an areawide health careers committee can be established to facilitate coordination of present activities and to stimulate a broadened program. Such an expanded program might include (a) extension of surveys of local opportunities in health careers, (b) expansion of the health careers programs presented in the schools, (c) health careers workshops for school personnel, and (d) a speakers bureau to supply schools with speakers who represent the various health professions.

Summary

A locally oriented health careers manual was created by the Glens Falls District Office of the New York State Department of Health and distributed to all school guidance departments within the health jurisdiction.

The value of this particular manual lies in its comprehensive format and its local orientation.

It supplies, within a single, easily handled volume, all the specific information needed by a high school student to help him decide on a career in the health field. The material is arranged for easy reference. Annual revisions can be incorporated with a minimum amount of effort.

The manual has been well received by local guidance counselors. They have expressed the opinion that it has proved of definite value to

them in their work, and that it is a useful instrument in recruiting more high school graduates for health careers.

The manual is the first step in the recruiting activities of the district office. Other possibilities for future efforts are suggested. They include formation of an areawide health careers committee and providing the schools with workshops, speakers, and additional programs to stimulate interest in the health professions.

Recruitment Literature Used in Health Careers Manual

"Stepping Up to a Career." American Podiatry Association, 3301 16th St. NW., Washington 10, D.C.

"Be a Dental Assistant." *"Dear Jill."* American Dental Assistants Association, 410 First National Bank Building, LaPorte, Ind.

"Dental Hygiene Aptitude Testing Program." American Dental Hygienists Association, 304 East 45th St., New York 17, N.Y.

"Accredited Dental Hygiene Schools." American Dental Association, Council on Dental Education, 222 East Superior St., Chicago 11, Ill.

"I Am a Dental Hygienist—May I Interest You in My Profession?" Dental Society of the State of New York, Council on Dental Health, Hotel Granada, 268 Ashland Pl., Brooklyn 17, N.Y.

"Careers in Dentistry." *"Dental Aptitude Testing Program."* American Dental Association, 222 East Superior St., Chicago 11, Ill.

"Should You Be a Dentist?" New York Life Insurance Co., 51 Madison Ave., New York 10, N.Y.

"Dietetics as a Profession." *"Chart our Course Toward Dietetics."* *"The Future is Bright—Look Ahead."* *"Dietitians in Demand."* American Dietetic Association, 620 North Michigan Ave., Chicago 11, Ill.

"Hospital Careers." Hospital Association of New York State, Inc., 11 North Pearl St., Albany 7, N.Y.

"Hospital Administration as a Career." American College of Hospital Administrators, 620 North Michigan Ave., Chicago 11, Ill.

"Be a Medical Librarian!" *"Choose Medical Librarianship."* Medical Library Association, % Martha R. Neville, Presbyterian and Woman's Hospitals, 230 Lothrop St., Pittsburgh 13, Pa.

"Face the Future With Security." *"About to Choose a Career?—Consider Medical Record Library Science."* American Association of Medical Record Librarians, 510 North Dearborn St., Chicago 10, Ill.

"Approved Schools of Medical Technology." American Medical Association, Council on Medical Education and Hospitals, 535 North Dearborn St., Chicago 10, Ill.

"The Profession of Medical Technology—A Career of Service in Science." *The Registry of Medical Technologists of the American Society of Clinical Pathologists."* American Society of Clinical Pathologists,

Registry of Medical Technologists, Mrs. Ruth Drummond, Registrar, Muncie, Ind.

"Your Career in Nursing—A Directory of Schools of Nursing in N.Y. State." New York State Nurses Association, Katherine E. Rehder, Executive Director, 385 State St., Albany 10, N.Y.

"Careers in Mental Health as a Psychiatric Nurse." (PHS Pub. No. 26.) U.S. Public Health Service, Washington 25, D.C.

"Picture of a Woman With a Future." American Nurses Association, Industrial Nurses Section, 2 Park Ave., New York 16, N.Y.

"On the Way Up—Practical Nursing." National Association for Practical Nurse Education, 654 Madison Ave., New York 21, N.Y.

"Should You Be a Nurse?" New York Life Insurance Co., 51 Madison Ave., New York 10, N.Y.

"The Public Health Nurse in Your Community." U.S. Public Health Service, Washington 25, D.C.

"Your Career in Public Health Nursing." *"For Those Who Need Her—Meet Your Public Health Nurse."* New York State Department of Health, 84 Holland Ave., Albany, N.Y.

"Facts About Occupational Therapy." *"Before You Enter An Occupational Therapy Course."* *"Play On the Recovery Team—Be An Occupational Therapist."* *"Colleges and Universities Offering Courses in Occupational Therapy."* American Occupational Therapy Association, 250 West 57th St., New York 19, N.Y.

"Planning Your Professional Career—Optometry." American Optometric Association, 4030 Chouteau Ave., St. Louis 10, Mo.

"A Profession in Orthoptics—Needed, Satisfying, Profitable." American Orthoptic Council, John W. Henderson, M.D., Department of Ophthalmology, University Hospitals, Ann Arbor, Mich.

"The Osteopathic Profession and Its Colleges." American Osteopathic Association, 212 East Ohio St., Chicago 11, Ill.

"Should You Be a Pharmacist?" New York Life Insurance Co., 51 Madison Ave., New York 10, N.Y.

"Physical Therapy Programs Approved by the Council on Medical Education and Hospitals of the American Medical Association." *"Physical Therapy Offers*

You a Rewarding Career of . . . Service, Satisfaction, Security." "Sources of Financial Assistance for Physical Therapy Students." American Physical Therapy Association, 1790 Broadway, New York 19, N.Y.

"Should You Be a Doctor?" New York Life Insurance Co., 51 Madison Ave., New York 10, N.Y.

"So, You Want To Be a Doctor?" American Medical Women's Association, Inc., 1790 Broadway, New York 19, N.Y.

"Medical Internships in the Public Health Service." U.S. Public Health Service, Washington 25, D.C.

"Careers in Mental Health—Psychiatry, Psychiatric Social Work, Psychiatric Nursing, Clinical Psychology." (PHS Pub. No. 23.) *"Careers in Mental Health . . . As a Psychologist."* (PHS Pub. No. 27.) U.S. Public Health Service, Washington 25, D.C.

"Health Education as a Career." Society of Public Health Educators, 1790 Broadway, New York 19, N.Y.

"Careers in Physiology." American Physiological Society, 9650 Wisconsin Ave., Washington 14, D.C.

"Shall I Study Chemistry?" American Chemical Society, 1155 16th St., NW., Washington 6, D.C.

"Toward a Healthier World—Your Career in Sanitary Engineering." U.S. Public Health Service, Washington 25, D.C.

"More Than a Job . . . Medical Social Work." National Association of Social Workers, Inc., Medical Social Work Section, 95 Madison Ave., New York 16, N.Y.

"Is This Your Line?" National Association of Social Workers, Inc., Psychiatric Social Work Section, 95 Madison Ave., New York 16, N.Y.

"Careers in Mental Health . . . As a Psychiatric Social Worker." (PHS Pub. No. 28). U.S. Public Health Service, Washington 25, D.C.

"Educational Qualifications of Public Health Statisticians." American Public Health Association, 1790 Broadway, New York, N.Y.

"Veterinary Medicine as a Career." American Veterinary Medical Association, 600 South Michigan Ave., Chicago 5, Ill.

"Colleges and Universities Receiving Teaching and Traineeship Grants for Rehabilitation Counselor Training, 1958-1959 Academic Year." Office of Vocational Rehabilitation, U.S. Department of Health, Education, and Welfare, Washington 25, D.C.

"Careers in X-ray Technology." American Society of X-ray Technicians, 16 14th St., Fond du Lac, Wis.

"Health Careers Calendar." National Health Council, 1790 Broadway, New York 19, N.Y.

Estimates of Acute Illness and Injury Among Children

Young children suffered acute illnesses with twice the frequency of adults during the year ending June 30, 1958, according to a report issued by the U.S. National Health Survey of the Public Health Service. The incidence rates for acute conditions involving medical attention or activity restriction ranged from an average high of four occurrences a year for children under 5 years old to a low of two for adults 25 years or over.

The report, which reveals the relative concentration of these illnesses and injuries—including everything from chickenpox and sore throat to appendicitis and broken legs—among children states that adults over 25 averaged 24.1 days of restricted activity from illness or injury per person during the year, compared with a range of 13.2 to 16.4 for age groups under 25.

Home accidents among children under 15 years of age were the chief cause of injuries restricting activity or requiring medical attention. They were an important cause, along with motor vehicle and work accidents, of restricted activity in the 15-24 age group.

The estimates are derived from interviews conducted for the National Health Survey by the U.S. Bureau of the Census with a representative sample of the civilian, noninstitutional population. The information recorded about individuals is confidential; only statistical totals are published.

The report is entitled "Children and Youth, Selected Health Characteristics, United States, July 1957-June 1958."

Translated from the Russian

Tel'tsa Provacheka pri Trakhome i Ikh Epidemiologicheskoe Znachenie

Prowazek Bodies in Trachoma and Their Epidemiological Significance

F. F. SYSOYEV

The original version in Russian appeared in *Vestnik Oftalmologii* (Journal of Ophthalmology), Moscow, March-April 1956, pages 3-9. Docent Sysoyev is head of the eye disease clinic of the Izhevsk Medical Institute, in Udmurt, A.S.S.R., R.S.F.S.R. The paper was translated in the Russian Scientific Translation Program of the National Institutes of Health, Public Health Service. It is presented here because of its interest to both ophthalmologists and public health workers.

THE DISCOVERY of bacterial carriage, the elucidation of the role of the human carrier in the spread of contagious diseases, and the development of epidemics are of exceptionally great importance.

At the present time, the carrier state has been studied and established for many diseases, for example, typhoid fever, bacterial dysentery, cholera, diphtheria, scarlet fever, plague, tularemia, brucellosis, pertussis, epidemic hepatitis (Botkin's disease), poliomyelitis, syphilis, tuberculosis, and in a number of ultravirus (N. F. Gamaleya), protozoan (various types of malaria), and other infectious diseases (I. R. Drobinskiy, 1953).

Trachoma has long been recognized as an infectious disease, and recent investigations have almost completely confirmed the virus origin of

it. The elementary bodies of the Prowazek-Halberstaedter intracellular inclusions are considered to be the only causal agents of trachoma (V. V. Chirkovskiy, M. P. Chumakov, Sh. D. Moshkovskiy, A. A. Avakyan, N. A. Zaytseva, A. L. Kankrov, P. N. Zhurin, Grosfel'd, P. Thygeson, Ishihara, and others).

We have set before ourselves the task of clarifying, by means of conjunctival scrapings for Prowazek-Halberstaedter bodies, the question of whether a carrier state exists in clinically healthy persons in foci of trachoma and in those who are clinically cured convalescents, that is, in stage 4 of trachoma.

In the literature available to us we have not been able to find much information concerning the detection of Prowazek bodies in the clinically normal ocular mucosa.

A. L. Kankrov (1928), who was a proponent of the specific nature of the intracellular inclusions in trachoma, noted the presence of trachomatous inclusions in the conjunctiva under certain conditions even in the absence of the clinical picture of trachoma. He observed that "when trachoma was present in one eye, intracellular inclusions were found in the scrapings of the other, healthy eye." "Could it be certified," he asked, "that their presence there is not the beginning of the disease, which has not yet manifested itself in any way?" (quoted by V. V. Chirkovskiy, *Vestnik Oftalmologii*, 1950, No. 3).

In her work (at the Trachoma Institute at Ashkhabad, devoted to the specificity of the Prowazek bodies in trachoma) Gorbunova pointed out that acute epidemic conjunctivitis produced by the Koch-Weeks, Morax-Axenfeld bacilli, and others were accompanied

in 13.7 percent of the cases by the appearance of the intracellular inclusions of Prowazek (quoted by V. V. Chirkovskiy, *Vestnik Oftalmologii*, 1950, No. 3). However, she did not report whether or not the clinical picture of trachoma developed after the conjunctivitis were cured. If not, then it is possible that in the given cases virus carriage existed, and the conjunctivitis exerted a provocative influence on the appearance of the Prowazek bodies.

Izabolinskiy and V. I. Spasskiy also speak of the presence of Prowazek bodies in the normal conjunctiva.

P. N. Zhurin (1951) examined 51 healthy eyes in 43 persons; of these, 27 persons had trachoma in only 1 eye. Prowazek bodies were found in conjunctival scrapings of five healthy eyes in five persons who had a disease in the other eye suspected of being trachoma, and in which Prowazek bodies were present.

The day after the Prowazek bodies were found, the healthy eyes became diseased in all cases, and after 2 days, a clinical, acute conjunctivitis developed, followed later by typical trachoma in both eyes. The author believes that the Prowazek bodies were found by him in the last few days of incubation, although this contradicts the data of Miyashita, who after an artificial transplantation of trachoma from person to person did not find Prowazek bodies in the incubation period.

Of the foreign authors, Bodian (1947) reported that out of 100 Fiji natives working for the American Army, signs of trachoma were found in 22 clinically. In 15 of these 22 persons, typical Prowazek bodies were found in the epithelial cells. Of 78 persons who did not have clinical signs of trachoma, 27 had inclusions morphologically identical with the inclusions found in the trachoma patients. Transmissibility and pathogenicity of the trachoma virus in these persons were not proved by the author, nor were the results of further observation of them described.

It is known that Prowazek inclusions are found most often in fresh trachoma or even in the prefollicular stage (Grosfel'd, G. Kh. Kudoyarov, and others) as well as in untreated trachoma. After treatment, they disappear or are found with great difficulty, and after therapy is stopped they can be demonstrated again.

In cicatricial trachoma they are very rarely found (V. P. Odintsov).

At the suggestion of V. V. Chirkovskiy (1953), trachoma in which the cicatrization of the conjunctiva has been completed, with no hyperemia or infiltration, is distinguished as stage 4 (absolute trachoma).

"Separation of the fourth period of trachoma into a special clinical form," writes V. V. Chirkovskiy, "is expedient for the purpose of characterizing the conclusion of the process, although, in essence, it is the same, third period of trachoma, the cicatricial. Establishment of its presence is important also in an epidemiological connection, because this period, in contrast to the others, is considered noninfectious by us."

Later, he mentions "that by the fourth period we understand not only those resultant forms of trachomatous inflammation where there is diffuse terminal cicatrization of the lids but also those cases where the trachoma has been concluded with the formation of individual scars, even though hardly noticeable, but where the conjunctiva does not show inflammatory signs."

According to the data of A. L. Kankrov (1928), in cicatricial trachoma (it must be assumed that this is the fourth stage, according to the modern classification) Prowazek bodies are rarely found.

In the literature available to us in recent years we have not been able to find any reports of investigations of Prowazek bodies in the fourth stage of trachoma.

In his work at the Chuvash Trachoma Institute, 1951, devoted to the problem of Prowazek bodies, P. N. Zhurin examined 1,039 trachoma patients admitted for the first time and in stages 1, 2, and 3, but apparently no investigations were carried out for Prowazek bodies in stage 4 trachoma patients.

From November 1952 through December 1954 the Izhevsk Medical Institute eye disease clinic examined 11 inhabited places with the aim of demonstrating Prowazek bodies both in trachoma patients and in clinically healthy persons. Trachoma patients in each of the four stages, persons suspected of trachoma, those with follicular and catarrhal conjunctivitis, as well as persons with clinically healthy palpebral conjunctivae were included.

For each inhabited place a special examination journal was kept on the type of the family-homestead list card. Each journal sheet was designed for a single family.

In order to obtain a surface scraping of the conjunctiva, the upper lid of the eye under examination was everted on a lid elevator, and in cases where the conjunctiva was contracted, even without the aid of the lid elevator, a conjunctival scraping was taken with a dull scalpel from the area of the upper edge of the cartilage and the plica semilunaris (superior fornix). In certain cases, depending on the picture of involvement of the conjunctiva, the scrapings were taken from the plica semilunaris of the lower lid (inferior fornix). The material obtained was spread out on a glass slide. From the material taken from each eye a single preparation was made. The scrapings were examined in the clinic laboratory. They were stained by the Romanowsky-Giemsa method, without fixation.

We classified the Prowazek bodies in groups as typical or atypical. Bodies with definite granulation in the form of caps around the nucleus of the epithelial cell belonged to the typical group. With respect to number, the bodies detected were classified as multiple, when there were two to three or more bodies in the microscopic field or in the preparation (in three patients with stage 4 trachoma there were three to four bodies in the microscopic field), and single, when after prolonged search only one or two Prowazek bodies were found in the preparation.

Prowazek bodies were considered atypical in which the granulation existed in the form of compact granular clumps disposed near the nucleus of the cell, or in cases of those bodies which were found in a stage of lysis.

P. N. Zhurin believes that "at the present time all the so-called atypical inclusions cannot be regarded as nonspecific substances, and one cannot avoid studying them and taking them into consideration in the evaluation of the problem of the etiological role of Prowazek inclusions."

We examined scrapings for Prowazek-Halberstaedter bodies in 2,933 persons. Of these, there were 53 persons suspected of trachoma, 13 with stage 1 trachoma, 19 with stage 2

trachoma, 491 with stage 3 trachoma, and 795 with stage 4 trachoma, 151 with catarrhal conjunctivitis, subacute and chronic, and 114 with follicular conjunctivitis. There were 1,297 clinically healthy persons.

On examination of the scrapings, Prowazek bodies were found in 3.8 percent of the persons suspected of trachoma. In patients who had trachoma they were found as follows: stage 1, in 23 percent; stage 2, 10.5 percent; stage 3, 9.49 percent; and stage 4, 4 percent. They were found in 0.7 percent of patients with catarrhal conjunctivitis, in 1.8 percent with follicular conjunctivitis, and in 1 percent of clinically healthy persons.

If account is also taken of the atypical Prowazek bodies found, the percentage of positive results is increased in all patients with the exception of the persons suspected of having trachoma and patients with stage 1 trachoma. The percentage of atypical bodies compared with typical ones was particularly high in clinically healthy persons: typical, 1 percent; atypical, 1.85 percent; together, 2.9 percent.

Of the 795 patients with stage 4 trachoma, 249 had been spontaneously cured, 271 had been treated in early childhood, 158 had been treated at intervals, and 117 had received systematic treatment.

Of the group of patients with stage 4 trachoma, antirelapse treatment had been conducted in only 168; of these, typical Prowazek bodies were found in 4 persons (2.4 percent). Of the 627 patients who had not received antirelapse treatment, there were more with typical Prowazek bodies, 4.55 percent. In the great majority of patients single Prowazek bodies were found, including those who had had a spontaneous cure, those treated in early childhood, those treated at intervals, and those treated systematically.

As had already been mentioned, of the 1,297 clinically healthy persons typical Prowazek bodies were found in 13 (1 percent); atypical ones, in 24 (1.8 percent). We wanted to clarify whether or not there was a difference in the percentage of Prowazek bodies found in contacts and in those who had not had contact with the disease. There was practically no difference—2.5 and 3.2 percent, respectively.

Data of an ordinary clinical examination with

the naked eye, or sometimes with the aid of a binocular magnifying glass, make it possible to decide that the trachomatous process had been concluded; nevertheless, as has now been established, foci of still-smoldering infection are found in a significant portion of the cases when they are examined by means of a slit lamp (N. Ya. Pokhisov, K. I. Golubeva, T. I. Voinova, T. D. Zatsepina, and others).

In order to clarify whether a state of cure of the trachomatous process existed, we (F. F. Sysoyev, N. T. Novoselova) checked 73 patients with stage 4 trachoma who were under the observation of the polyclinic group of the eye clinic. Examination was made of the conjunctiva and cornea by means of the slit lamp, and scrapings were taken for Prowazek bodies. In one of this group of patients the diagnosis of stage 4 trachoma was not confirmed by the slit lamp examination. No changes were found in the conjunctiva or cornea. He was healthy. No Prowazek bodies were found on two examinations of scrapings. There was no one who had trachoma in the family. In the other 72 patients, slit lamp examinations and examinations of scrapings were conducted once in 38, twice in 25, 3 times in 8, and 4 times in 1 patient.

In 30 trachoma patients complete cure had not occurred, and pathological elements were found in the form of small focal infiltrations and solitary follicles deeply situated in the tarsal conjunctiva. Of the patients in this group, Prowazek bodies were found in two. Often, cases were noted where the trachomatous process proved to be terminated in the conjunctiva of the lower lids, while there were elements of unhealed trachoma on the conjunctiva of the upper lids.

On repeated examinations of 30 patients with stage 3 trachoma no particular changes were noted in the clinical picture: the focal infiltration did not decrease, and the deep-seated follicles were not absorbed (6 months of observation). Stage 3 trachoma passed into stage 4 trachoma in only 1 patient.

Of 42 patients examined by the method of biomicroscopy, Prowazek bodies were found in 1.

Regressive or cicatricial pannuses of varying degrees of activity were found in all patients on examination with the slit lamp.

As has already been mentioned, out of the 2,933 persons, stage 4 trachoma was established in 795 by an ordinary examination, and Prowazek bodies were found in 45 of the 795 persons. Forty-three patients in whom there were Prowazek bodies were checked by the slit lamp at various periods after the first examination (6 to 24 months); of these, the trachoma remained unhealed in 19. Just as in the preceding group, small focal infiltration and solitary, deeply seated follicles were found in the tarsal conjunctiva (stage 3). Of the patients in this group, Prowazek bodies were found repeatedly in five.

Twenty-two persons proved by slit lamp examinations to be cured. Prowazek bodies were found repeatedly in two persons; two others had no signs of having had trachoma (healthy).

Therefore, of 116 patients in whom stage 4 trachoma had been established by the usual methods of examination, unhealed trachoma was found in 49 with the aid of the slit lamp; Prowazek bodies were found both in the unhealed and in the healed (convalescent carriage) cases.

Thirty-six persons who were clinically healthy but had Prowazek bodies were checked with the slit lamp; 17 proved to be completely healthy, 13 had stage 4 microtrachoma [very small trachomatous area], and there was 1 patient each with stage 4 trachoma, with follicular conjunctivitis, with folliculosis, with stage 3 microtrachoma, and with stage 3 trachoma. One was not accounted for.

Prowazek bodies were found repeatedly in two of the group of biomicroscopically healthy persons.

Two persons were checked for follicular conjunctivitis: in one a follicular conjunctivitis was shown; in the other, a *forme fruste* of trachoma. Of two patients with chronic conjunctivitis both proved to be healthy [with respect to trachoma]; in those with acute conjunctivitis, one proved to be healthy. In these patients it was impossible to find Prowazek bodies in repeated scrapings.

As has been mentioned, typical Prowazek bodies were found in 13 clinically healthy persons. On slit lamp examination, six persons of this group were shown to have healthy conjunctivae, while Prowazek bodies were found re-

peatedly in one. In one of those examined, typical Prowazek bodies were found repeatedly, whereas at first examination, atypical Prowazek bodies had been found. We found atypical Prowazek bodies in clinically healthy conjunctiva, as well as in stage 2, 3, and 4 trachoma, which confirms P. N. Zhurin's opinion that "at the present time all the so-called atypical inclusions cannot be regarded as nonspecific substances, and one cannot avoid studying them and taking them into consideration in the evaluation of the problem of the etiological role of Prowazek inclusions."

Therefore, it may be considered that Prowazek bodies are found in biomicroscopically established stage 4 trachoma (convalescent carriage) as well as in clinically healthy persons (virus carriage).

Those cases of carriage among persons clinically completely healthy in foci of trachoma, where it was also possible for us to establish trachoma biomicroscopically, are in accordance with the concept of carriage as it applies to other diseases.

Perhaps, at the current stage of our knowledge it is impossible to exclude the existence of asymptomatic trachoma in cases where the clinical manifestations of trachoma cannot be established by our methods, even by the slit lamp, even though Prowazek bodies are found.

For practical purposes it is very important to establish the criteria of recovery in trachoma. Apparently, even the slit lamp examination does not give complete assurance of the termination of the process. In certain cases with apparent clinical recovery histological examination reveals infiltration in the depth of the tissue (V. V. Chirkovskiy, V. N. Spasskiy, N. M. Pavlov, K. I. Golubeva, and others).

Absence of Prowazek bodies in clinically terminated trachoma is not always conclusive proof of complete healing, because Prowazek bodies are not always easily found even in cases where they may be present. Their presence in clinically healed trachoma undoubtedly speaks for the incomplete elimination of the trachoma virus from the conjunctiva (convalescent carriage), because "clinical recovery (temporary or permanent) is far from being always associated with the elimination of the pathogenic

causal organisms from the body" (I. R. Drobin-skiy, 1953).

It may be supposed that with clinical healing of the trachomatous process (stage 4) in certain cases the virus is kept in a latent condition without producing any reactions in the ocular mucosa for a long time. However, sometimes, apparently through the influence of factors of the internal milieu and under the effect of external causes, the virus can become activated and multiply; this is manifested clinically by what we call a relapse.

G. Kh. Kudoyarov mentions the *forme fruste* of trachoma; N. M. Pavlov, the latent form; M. I. Averbakh, N. Ya. Pokhisov, and others, microtrachoma. In prophylactic examinations carried out on a large scale such patients are recorded as clinically healthy, and it is not taken into consideration that they are virus carriers. Under certain conditions, given the presence of the trachoma virus and under the influence of factors of the internal or external milieu, the characteristic clinical picture of the disease can develop, diagnosable by ordinary methods of examination. How else can those cases of trachoma be explained where no source of infection is established?

Everything which has been said is of tremendous epidemiological significance and makes it necessary to observe and conduct prophylactic measures systematically in foci of trachoma even in the event all the members of a family are considered cured.

As far as fresh cases are concerned, which in practice are recorded as "new infections," they apparently are not always new; in certain cases, the so-called latent cases or the *formes frustes* of trachoma during exacerbations can give the picture of stage 1 trachoma (G. Kh. Kudoyarov). The possibility of serious relapses in stage 4 microtrachoma has not been excluded either.

Often, complete healing is observed without notable traces on the conjunctiva and cornea revealed by the naked-eye examination both after advanced and incipient forms of trachoma (G. Kh. Kudoyarov). In Udmurt, such cases are recorded, after repeated prophylactic examinations, as stage 4 trachoma ("healthy") in contrast to those cases in which scars are detected by simple examination and which are

recorded simply as stage 4 trachoma. This makes it possible, when a suitable account is kept (yearly records in general examination journals), to evaluate relapses more accurately in case they occur in persons in whom healing has occurred without notable traces, instead of having to record them as a new disease.

Many ophthalmologists believe that there are no relapses in the healed form of trachoma, and if a relapse has occurred it means that the trachoma was not healed, or that a second infection has been sustained. The percentage of relapses among those clinically healed, according to various authors, ranges from 7 to 25 (M. P. Chumakov).

In Udmurt, the percentage of relapses in various rayons [districts], according to the data of the trachoma dispensary, ranges from 1.8 to 12.5, while the average percentage amounts to 8.3.

It should be taken into consideration that the tremendous majority of relapses represent insufficiently healed trachoma. The criteria of cure have not as yet been established. In the large-scale prophylactic examinations the diagnosis is made with the naked eye or at best by means of the binocular magnifying glass, whereby subjectivism is possible.

According to directive No. 43 of the U.S.S.R. Ministry of Health, dated January 16, 1952, patients may be removed from the trachoma record only after their clinical recovery has been established by a medical board, which must draw up a document concerning the state of cure or fill in a special card as a record of the results of antibiotic treatment (A. S. Savvaitov). This directive eliminates subjectivism to a considerable degree and contributes to a more serious approach to the establishment of the state of cure. However, there are relapses even after such conclusions.

The Ministry of Health recommends that observations be made of those who have been removed from the record (stage 4 trachoma) for another 4 to 6 months (A. S. Savvaitov). From the experience of the Udmurt Republic it may be stated that this period of observation is not always sufficient. Relapses may occur sometimes even many years after recovery. Therefore, in foci of trachoma it is not practical to establish periods of observation of those who

have been cured, but rather a systematic observation of them should be conducted without setting time limits.

In rural localities of Udmurt we recommend the checking of all those cured (stage 4) by qualified nurses and feldshers, with whom they register no less than twice a month. In the event signs of a relapse are found, treatment should be begun without waiting for the instructions of the physician, and when the physician visits this inhabited place such patients should be presented for consultation.

Timely detection of relapses and elimination of them is a problem of current importance on a par with treatment of patients who are still active in foci of trachoma. "Outbreaks of fire should be extinguished quickly."

In Udmurt, a large number of patients have been cured in the past 5 years. In certain inhabited places there have been only single patients, whereas there are 50 to 100 or more cured.

Naturally, the problem may arise as to whether it is practical to leave trachoma stations in such settlements, or whether it is time to eliminate them. At the given stage of our knowledge, this is impractical and premature, because the lack of complete clarity in the diagnosis of healed trachoma and the existence of relapses require the unflagging attention to and observation of those in whom the disease has passed into stage 4. If attention to stage 4 trachoma patients is lessened, a new rise in the morbidity rate curve is possible in the foci in consequence of relapses and new infections. Therefore, trachoma stations had to be left in settlements where few active patients remained. However, at such stations there may prove to be insufficient work for the nurses. With what should they occupy themselves, aside from treating patients with trachoma and prophylactic work? Nurses who have not completed their secondary-school medical education should increase their medical qualifications by means of correspondence courses given by the medical schools, while those who have completed secondary medical schools should have their medical qualifications increased by means of seminars organized for them. After their qualifications are increased, the trachoma stations should be converted into kolkhoz medical stations, at

which not only treatment of the trachoma patients remaining and prophylactic work will be carried out, but where also kolkhozniks will receive other forms of medical aid within the limits of competency of the nurse. Thus, gradually, with the elimination of trachoma, the trachoma stations should be reorganized as kolkhoz medical stations.

Conclusions

1. After establishment of the existence of stage 4 trachoma by ordinary methods of investigation, elements of unhealed trachoma remain in almost half of the patients in the form of small focal infiltrations and solitary follicles deeply situated in the tarsal conjunctiva or at the corners of the cartilages (stage 3).

2. Prowazek bodies are found even in those in whom the diagnosis of healed trachoma had been established biomicroscopically (convalescent carriage), which is of epidemiological significance.

3. In foci of trachoma the possibility of carriage of it by persons who are clinically completely healthy has not been excluded.

4. Patients with the so-called *forme fruste* of trachoma, latent trachoma, and microtrachoma are often recorded as healthy in ordinary examinations, but in practice are virus carriers. Therefore, the possibility of infection from them has not been excluded. Under certain conditions, the characteristic clinical picture of the disease can develop in them, diagnosable even by ordinary methods of examinations.

5. The criterion of the state of cure of trachoma, that is of complete safety for those around with a guarantee against relapses, has not as yet been established. Therefore, at the current stage of the fight against trachoma, registration and account of the healed cases (stage 4) and constant observation of them are obligatory, and antirelapse therapy is desirable.

6. The period of 4 to 6 months established for observation of the healed cases (stage 4) should be considered arbitrary. Systematic observation of them should be carried out without definition of periods of time.

7. In view of the relapses observed in those who have been cured, the trachoma (medical) stations in the trachoma foci should be maintained for a certain time even in the event all the patients are cured.

Grants for Evaluating Glaucoma Diagnosis Techniques

A 5-year study to evaluate methods for screening and diagnosing glaucoma in the United States has been launched with the financial support of the Public Health Service's National Institutes of Health.

Techniques currently applied to the detection and identification of glaucoma are now being evaluated at four research centers in this country through grants awarded by the National Institute of Neurological Diseases and Blindness. The grants are expected to total approximately \$115,000 a year.

The grantees are the Wilmer Institute, Johns Hopkins University Hospital, Baltimore; Moffitt Eye Hospital, University of California Medical School, San Francisco; Department of Ophthalmology, Washington University School of Medicine, St. Louis; and the Department of Ophthalmology, State University of Iowa, Iowa City.

The cause of the disease is unknown. Early detection might allow saving the patient's eyesight, but diagnosis in early stages is difficult because the patient often feels no discomfort. Since glaucoma appears to be a family disease, a large proportion of individuals studied will be children of glaucoma patients.

A statistical analysis of the study data is planned by the Chronic Disease Branch of the Service's Bureau of State Services.

STATEMENT

*By Arthur S. Flemming, Secretary of Health,
Education, and Welfare, April 20, 1959*

Accidental Poisoning

I want to call to public attention, and particularly to the attention of parents, data on accidental poisoning received by the National Clearinghouse for Poison Control Centers.

The clearinghouse, established in Washington by the Public Health Service in 1957, has now completed an analysis of 4,000 cases which came to the attention of local poison control centers between July 1956 and April 1958. Ninety percent of the cases analyzed involved children and were typical of the accidents that account for almost 500 child deaths and an estimated 600,000 nonfatal poisonings of children annually.

Children under 5 years of age represented 86 percent of the cases analyzed, the largest number being 1 or 2 years old. A study of the causes clearly indicates that American adults are not taking adequate precautions to protect children in a society that uses over 250,000 different kinds of drugs and household products, many of which are potential killers if misused.

A growing number of communities are establishing poison control centers to cope with poisoning problems. The first center was organized in Chicago in 1953 with support of the American Academy of Pediatrics. There were 130 centers in 1957, and today there are 260 operating in 42 States and the District of Columbia. (States that have no poison control centers listed with the national clearinghouse are: Rhode Island, Vermont, Louisiana, Nevada, Wyoming, Montana, Idaho, and Maine.) The centers maintain records of ingredients of trade-name products plus antidotes. This information is available to physicians by telephone day or night. Parents who call the

centers are given first-aid instructions and advised to call their doctor.

In 85 percent of the cases analyzed by the clearinghouse, children were under the supervision of a parent at the time the accident occurred; 10 percent were being cared for by other adults; and only 5 percent had been left in the charge of other children. How even a few minutes' negligence can cause tragedy is illustrated by the following cases:

A mother who left a can of cleaning fluid on the kitchen table while she answered the telephone returned to find her 2-year-old child had swallowed the fatal fluid. A grandfather put kerosene into an empty coffee can and was using it to clean car parts. While he turned his back briefly, his 16-month-old grandchild swallowed a small amount and died 9 hours later.

Evidence that the toxicity of common products is not generally recognized is the fact that many parents delay hours and even days in seeking treatment for children whom they know have swallowed drugs or household products.

For example, one of the fatalities, an 18-month-old child who swallowed iron sulfate pills prescribed for his parent received no medical attention until 2 days later. A delay of 6 hours in seeking medical care proved fatal for a 2-year-old child who swallowed a few grains of a cornmeal-sugar-rat poison mixture. The mother had put the mixture on the floor late at night and swept it up in the morning, but enough grains remained to kill the child.

Aspirin tops the accident list, accounting for a fourth of the cases studied, most of them small children who swallowed candied aspirin.

Prompt stomach pumping prevented serious consequences in most of these cases and there was only 1 aspirin fatality—a 2-year-old child who swallowed 35 tablets and died a day later despite prompt hospitalization and treatment.

Bleaches, detergents, soaps, water softeners, waxes, polishes, lighter fluids, cosmetics, insecticides, and herbicides as well as all types of medicines and drugs were among the products cited in the study as causing accidents of varying degrees of severity.

The three principal circumstances under which these products proved dangerous were: they were in old bottles or food cans instead of their original containers; they were not in their usual storage place; the storage place was not locked and was in reach of the child.

The place the accidents most frequently occurred were: the kitchen (41 percent of all cases); the bedroom (21 percent); and the bathroom (12 percent).

Most accidental poisoning could be avoided if parents of preschool children kept all products either under lock or out of reaching and climbing distance. Many serious consequences of poisoning could be prevented if parents called physicians promptly, without waiting for symptoms to appear.

Poison Control Centers

Most poison control centers are located in hospitals and maintain 24-hour telephone service, providing private physicians with information about the ingredients of trade-name products, antidotes, and other treatment. In most centers, inquiries are answered by a physician; nurses, pharmacists, or public health sanitarians handle inquiries in some; only 3 percent depend on clerks to relay information from the poison index cards which all of the centers maintain.

Emergency treatment is given in some cen-

ters, but their primary purpose is to furnish information to physicians. If a nonmedical person calls a center, he is given first-aid instruction and advised to call his physician.

The principal supporters of centers are State chapters of the American Academy of Pediatrics, State and city health departments, medical schools, and local medical societies. Some are also financed by parent-teacher associations and men's and women's service clubs. Frequently a number of organizations join together to provide financial aid, office space, personnel, and supplies. Children's Bureau grants-in-aid to State health departments also help to support some centers.

National Clearinghouse for Poison Control

The National Clearinghouse for Poison Control Centers serves local centers by providing information on new products which it obtains through a voluntary arrangement with manufacturers. Over 200 major producers of drugs and household products inform the clearinghouse of the ingredients their products contain and the antidotes for them. Since there is no law requiring that the ingredients of some of these products be printed on their labels—data which physicians must have in order to give proper treatment—the card indexes which the clearinghouse supplies to all centers are the chief source for such information.

The clearinghouse also receives reports of any new poison hazard discovered by any of the local centers and forwards the information to all other centers.

Additional activities of the clearinghouse include assistance to communities that wish to establish poison control centers, issuance of a monthly newsletter, tabulation and analysis of poison cases reported by the centers, and research.

Federal Publications

The Aged and the Aging in the United States. *Hearings Before the Subcommittee on Problems of the Aged and Aging of the Committee on Labor and Public Welfare, United States Senate; 1959; 313 pages.*

Statements and discussions by 22 expert consultants cover the health of the aged and aging; employment problems of the older worker and mandatory retirement; income maintenance and financing of medical care; and housing, living arrangements, and social services. Additional information includes reports, summaries of proposed legislation, 8 tables, and 10 charts.

Copies may be obtained by writing to Senator Pat McNamara, Chairman, Subcommittee on Problems of the Aged and Aging, United States Senate, Old Senate Office Building, Room 249, Washington 25, D.C.

The Dental Service Corporation in a Public Assistance Program. *PHS Publication No. 680; 1959; 50 pages.*

The dental care program of the Washington State Department of Public Assistance and its administration by the Washington State Dental Service Corporation are described. History, financing, eligibility and priorities for treatment, and dental fee schedules are discussed in detail.

Included in the appendix are copies of contracts between the corporation and the department and a complete set of tables covering the corporation's service for 1 year.

Health Manpower Source Book. Physicians, dentists, and professional nurses. *PHS Publication No. 263, Section 9; 1959; 80 pages; 50 cents.*

State, regional, and national data reveal trends in education, location, and specialization. They have been selected to provide background information for persons and organizations concerned with providing

health services and planning for the education of health personnel.

Tabulations relate to the 48 States and the District of Columbia except as otherwise indicated. Materials used in their compilation are identified on each table. Estimates to compensate for gaps in knowledge and to project findings to the future are included.

Health Statistics From the U.S. National Health Survey. Children and youth, selected health characteristics. United States, July 1957-June 1958. *PHS Publication No. 584-C1; 1959; 43 pages; 35 cents.*

The first of a new series which will carry health interview survey results for population groups, this report presents statistics on a variety of health topics among persons under 25 years of age.

Summary information is presented on acute conditions, persons injured, impairments, limitation of activity and mobility, disability days, hospital discharges, visits to the dentist and physician, and population estimates.

Arthropod-Borne Encephalitis. Procedures for investigating outbreaks. *PHS Publication No. 674; 1959; by Roy W. Chamberlain; 27 pages; 20 cents.*

Directed to doctors, veterinarians, and biologists, this field guide emphasizes obtaining materials for laboratory study. Instructions and lists of equipment are given for collecting and handling specimens from humans, horses, birds, and mosquitoes.

Staphylococcal Disease. A guide for organizing hospital inservice training programs. *PHS Publication No. 692; 1959; 15 pages; 30 cents.*

Directed to persons responsible for developing training courses for prevention and control of staphylococcal disease in hospitals, the suggested curriculum should be useful

also in helping to resolve other infectious disease problems in patient-care institutions.

Establishing a training committee, developing and maintaining a program, and course content for various personnel categories are discussed. A list of training aids is included.

Public Health Aspects of Increasing Tetraethyl Lead Content in Motor Fuel. *PHS Publication No. 712; 1959; 49 pages; 30 cents.*

The report of the Advisory Committee on Tetraethyl Lead to the Surgeon General of the Public Health Service is presented. Information on the consumption of tetraethyl lead, health and environmental data, and statements on the technical and hygienic aspects of increasing the tetraethyl lead content of gasoline from the present maximum of 3 cubic centimeters to a new maximum of 4 cubic centimeters per gallon are included.

Proposed regulations from an earlier Public Health Service publication on the use of tetraethyl lead in gasoline appear in the appendix.

Speaking of Prepaid Dental Care. A glossary of terms. *PHS Publication No. 679; 1959; 25 pages.*

Definitions for nearly 200 terms are given in this pamphlet designed primarily for persons interested in developing dental prepayment programs.

This section carries announcements of new publications prepared by the Public Health Service and of selected publications prepared with Federal support.

Unless otherwise indicated, publications for which prices are quoted are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Orders should be accompanied by cash, check, or money order and should fully identify the publication. Public Health Service publications which do not carry price quotations, as well as single sample copies of those for which prices are shown, can be obtained without charge from the Public Inquiries Branch, Office of Information, Public Health Service, Washington 25, D.C.

The Public Health Service does not supply publications other than its own.

THE INCIDENCE OF ILLNESS IN A GENERAL POPULATION GROUP

General Results of a Morbidity Study from December 1, 1921, Through March 31, 1924, in Hagerstown, Md.¹

By EDGAR SYDENSTRICKER, Statistician, United States Public Health Service

The problems and aims of public health are still set forth almost entirely in lethal terms whenever statistics are used. We speak of an unfavorable death rate and measure success in a lowered mortality. The best indices which have been available of the prevalence of nearly all diseases are the fatal cases only; and our epidemiology is limited, for the most part, to statistics of deaths.

The reasons for this condition are fairly clear to every vital statistician and will not be discussed here. Of greater pertinence is the result of a prolonged dependence upon mortality statistics. The effect has been to foster a fallacious premise for public health work, namely, that a low death rate indicates the presence of health. Obviously it does not. We know that, on the contrary, an exceedingly unhealthful region may exhibit a relatively low mortality, as, for example, a heavily infested hookworm locality or a section abounding in malaria. Pellagra may be widely prevalent in a community without affecting perceptibly its general death rate or even increasing materially the number of deaths from the disease itself. Instances of the same sort could be multiplied. The ill health that is manifested in symptoms, in discomfort, in lessened vigor and efficiency, even in illness and suffering, is not reflected in the death rate, except for certain diseases, for any purpose practicable in preventive work.

FEBRUARY 13, 1925, pp. 279-291

Edgar Sydenstricker's summary of provisional results of the first household survey by the Public Health Service in Hagerstown, Md., lit the path for the use of morbidity data about the Nation's population, in addition to mortality data.